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**A Comparative Study of Japanese and U.S.
Training Processes, Strategies and Outcomes
in Automobile Industry Suppliers**

presented by

Randall J. Lewis

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Ph. D. degree in A. C. E.

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**A COMPARATIVE STUDY
OF JAPANESE AND U.S. TRAINING
PROCESSES, STRATEGIES AND OUTCOMES
IN AUTOMOBILE INDUSTRY SUPPLIERS**

By

Randall Jon Lewis

A DISSERTATION

**Submitted to Michigan State University
In partial fulfillment of the
requirements for the degree of**

DOCTOR OF PHILOSOPHY

**Adult and Continuing Education
Department of Educational Administration**

1995

ABSTRACT

A COMPARATIVE STUDY OF JAPANESE AND U.S. TRAINING PROCESSES, STRATEGIES AND OUTCOMES IN AUTOMOBILE INDUSTRY SUPPLIERS

By

Randall Jon Lewis

An enormous amount of literature is available on management training. Management training has had more attention because companies have allocated training resources to this perceived area of need. Few case studies have been attempted in the area of production employee training. Even fewer have compared Japanese production training to U.S. production training.

The purpose of this research was to identify similarities and differences in processes, strategies and outcomes of U.S. located Japanese and American automobile industry suppliers. There are many preconceived notions about the Japanese and their views on manufacturing, quality, service and training. Many people are unaware of the unprecedented change occurring in American factories. The problem is that we seldom go to the source to discover the reality of our preconceptions. There is little understanding as to how training really affects an organization.

This research descriptively examined the production training of six companies in the Midwest. Managers,

trainers and production workers were questioned to find out how training is conducted, why it is important, and what benefits accrue to the organization.

The face-to-face interviews and questionnaires were examined to discover that, when compared to American firms, longer orientations and ongoing training are typical for Japanese companies. Additionally, they put more of their resources into screening potential production employees. Implications for further research include comparing answers to training questions among different employee ranks. There are significant differences in perception of the benefits of training programs among managers, trainers and trainees. These differences seem to hold true regardless of the country of origin.

ACKNOWLEDGEMENT

I wish to acknowledge Dr. Cas Heilman for his patience, support, encouragement and guidance. Also, I wish to thank Drs. Howard Hickey, William Cole and John Beck for their support and advice during the past year. Dr. Hickey deserves particular mention for stepping in when Dr. Heilman became ill. I have an enormous amount of respect for his willingness to take on a large role during retirement.

I would also like to thank the people at General Motors, especially Jim Logan and Stan Simons, who arranged for the company visitations. Although, I am unable to mention the companies or their employees, I wish to thank all the contact people and their generous co-workers.

Spring Arbor College deserves much of the credit for this study, providing needed financial and moral support. Specifically, Dr. Allen Carden, Dr. Mark Sargent and Betty Videto deserve honorable mention. Other faculty and staff also contributed to my completion of this study.

I had several friends who were very supportive and who prayed without ceasing during some very troubling times. They are Jaime Hartges, Graham Shipley and Richard Jacobson.

My father, Ronald Lewis, and mother, Margaret Lewis, deserve special mention because of the time they spent reading, re-reading, editing and typing. They were a

constant encouragement, never ready to give up on my ambitions.

My "in-laws", Harold and Helen Beam, and family, were a source of humorous prodding and motivation. They were always ready with a smile when the repeated answer to their question, "How much longer?" was "Only two more years".

My wife Helga was the single greatest contributor to this research because of her constant love, support and assistance. My son Jonathan, although distracting at times, kept my spirits high through laughter and gave me the desire to keep going.

None of these people could have done anything had it not been for the Lord Jesus Christ who held my hand and even carried me through the difficult situations that I encountered which included cancer and a very busy schedule.

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CHAPTER I

INTRODUCTION

Our world today is much more complex than the world our parents knew. World trade was much less developed and exchange rates were not flexible as they are today. The value of world exports in 1994 was over 4 trillion U.S. dollars. Export trade grew at an annual rate of approximately 12% during the 1980s and 1990s . However, export trade is only a part of global business. The figures are staggering when you include foreign direct investment and local subsidiary sales of multinational companies (Thorelli, Cavusgil, 1990).

In the United States, international trade is only about 7-11% of gross national product (GNP), but the US is one of the largest trading partners in the world. Belgium, Holland and South Korea export about half of their gross national products. Most industrialized nations export about 20% of their GNP. In recent years, the triad (Japan, Western Europe and the United States) have become extremely important markets for any globally oriented business (Thorelli, Cavusgil, 1990). When a multinational business moves its operations to a foreign country they bring a rich culture which shapes its management, marketing and

production techniques. These distinctive characteristics are at the heart of this research.

BACKGROUND OF THE PROBLEM

In the period immediately following World War II, the U.S. was virtually alone in its ability to mass produce products and provide services to its own citizens and the rest of the globe. More than thirty years after Germany and Japan began to rebuild their crumbled, war ravaged infrastructures, the U.S. awoke to a world of globally competitive products and services. This globally competitive environment continues to grow and challenges U.S. economic dominance at an ever increasing pace. Some major trends directly linked to global competition are:

1. Continued emphasis on quality driven products and services.
2. Increases in technology dependent products and services.
3. Growing emphasis on improving customer satisfaction.
4. The movement of foreign owned businesses to the U.S.

Quality: Products and Services

As a direct result of global readiness to compete, quality driven products and services have become the driving force for increased market share, sales and profitability. After holding a substantial market share in numerous

industries in the 1950s and 1960s, the U.S. had become complacent. In the 1970s and 1980s, the U.S. began to lose credibility in the production and delivery of dependable, high quality products and services. During this time period, the perceived quality of U.S. products was lower and prices were higher than other world competitors, especially Japan. Recent efforts to improve this credibility problem have been thoroughly documented, but the consumer is unforgiving, especially in the short run. It would be simple to blame unions or government regulation for quality setbacks but many foreign firms have been quite successful in the U.S. despite these perceived problems.

In the post World War II period, the late W. Edward Deming, after being rejected by American firms, brought a system of quality management to Japan. In 1950, he taught the theory of total quality management to the Union of Japanese Scientists and Engineers. Japan's economic success is rooted in quality; Japanese quality is rooted in W. Edward Deming (Rienzo, 1993). According to Deming's teachings (Lorinc, 1990), quality is the predictable absence of error. It is a customer-oriented result achieved only when management decides to work out system bound flaws in production and services rather than blame employees for poor workmanship and delivery of services. It is a never-ending

process of continuous improvement that he believed would lower costs and improve productivity and, finally, profitability.

Another quality "guru" responsible for the worldwide attention to quality is Joseph M. Juran (Quality Control Handbook, 1951). The Japanese invited Juran to deliver lectures on quality a few years after Deming. Juran defined quality as "fitness for use" and his writings set the stage for today's concept of total-quality management (TQM).

In 1987, Juran served on the original board of directors for the Malcolm Baldrige National Quality Award (Gordon, 1994). When J. M. Juran was interviewed in February 1994, he stated that the 21st century will be the "century of quality" compared to the 20th century which is the "century of productivity".

J. W. Juran is very enthusiastic about quality in the U.S. but states, "There have been a lot of false starts." Despite those who have missed the target in the 1980s, he believes many U.S. companies have achieved world-class quality. There are some examples of U.S. companies that have pushed toward a high quality benchmark and have been quite successful. John Deere's factories in Davenport and Dubuque, Iowa were registered to the ISO 9001 standard in Japan by the Japanese Machinery and Metal Inspection

Institute. The ISO 9000 series is recognized as a standard of factory quality performance in more than 90 countries (Lawson, 1994).

Another example of a U.S. firm serious about quality is the Ceclor division of Corning Inc. Their Blacksburg plant has received national recognition for its successful implementation of quality performance teamwork. A self-managed work team evolves through several stages of development which involve a change in culture, attitude, level of training, and commitment. These self-managed work teams are fueled by global competition, new technologies, shortened product life cycles, and a philosophy of continuous improvement and higher expectations (Green, 1994). As global competition continues to evolve and consumers increasingly demand higher quality and better responsiveness from manufacturers, more and more firms are turning to technology for assistance (Vineyard, Zeltman, 1993).

Firms Driven by Technology

Another key in the quest for global business lies in a country's ability to lead in high technology. This is based on scientific knowledge and is directly linked to the portion of dollars allocated to research and development (R&D). The spread of technology around the world is

allowing low-cost producers to challenge major firms' established positions in many markets. Technology is forming organizational structures, processes, and products and services (Chait, 1994).

Once a country experiences wage increases and strength in their currency, low technology industries are often relocated to other less developed nations and high technology industries become the means for future survival. More than 80% of the top 100 multinational U.S. based companies make high-value, high-technology products. The typical proportion of U.S. high-tech firms to total firms is around 50%. These high-tech firms derive 44% of their revenues on average from international sales (Kruytbosch, 1994).

Most executives have been exposed to downsizing, mergers, acquisitions, cost cutting and awesome technological changes (Sorgenfrei, 1994). The next century will be the period of information highways, wireless communication and digitization. Managers are advised to keep up on these and other technological changes (Vinocur, 1994).

Many business failures have arisen from the wrong responses to these emerging technologies (de Jager, 1994). While businesses have been in awe of the technological changes in the past decade, they have not seen anything

comparable to what will be developed in the next few years (Zavitz, 1994). Technology has become the driving force for domination of many markets and is certainly linked to improvements in quality and cost reduction. Technology can also be beneficial in adapting to a customer-oriented environment such as computerized mortgage servicing providing accurate updated loan information without waiting for a customer service representative. This brings us to another trend in this globally competitive environment, the desire to please the customer.

Putting The Customer First

The customer-oriented marketing concept was developed in the United States. This view, developed in the fifties, looked at the customers' needs rather than the needs of the factory. The new standard became "we make what we sell" instead of "we sell what we make". This philosophy has called attention to the simple fact that firms exist to serve the public. Certainly, this philosophy has become one of the cornerstones of marketing research among most industrialized countries and has been highly developed and fine tuned since the fifties (Thorelli, Cavusgil, 1990).

Today, the concept of Total Quality Management (TQM) is the contemporary product of customer-oriented thinking. The TQM approach assists companies in the pursuit of better

employee relations, higher productivity, increased customer satisfaction, larger market share and an improved bottom line (Halligan, 1992).

The current U.S. marketing model indicates that the organization must analyze customer needs and wants, and then make the product to fill those needs and wants at a profit. Marketing in the U.S. is based on a customer orientation, whereas global firms see customers from the perspective of market power. The U.S. has lost and is in danger of losing market power in many competitive areas (Morris, Kimball, 1992).

Service organizations and manufacturing firms have both been challenged to increase customer satisfaction and quality. Service organizations have reduced some customer contact by using manufacturing like operations while manufacturing firms are placing greater emphasis on the service they provide (Siferd, Benton, Ritzman, 1992).

Rising business failure rates are the inevitable result of losing customer attentiveness. Specifically, a key reason for business failures in the United States is that companies have not enlarged business plans to include quality related goals for improving customer satisfaction (Kobu, Greenwood, 1991). This is one reason for recent successes achieved in many U.S. located foreign transplants.

In many industries, their attention to the customer has improved perceptions of quality.

Foreign Presence in the U.S.

Foreign firms have been moving to the United States for many years. Firms of industrialized countries have consistently moved operations to the U.S. and beginning in the 1980's this trend began to increase, especially with regard to Japanese firms. The trend, having slowed somewhat, is still alive and well in the 1990's. Foreign firms have many incentives to move production and direct investment into the U.S., including the circumvention of U.S. trade barriers, guarding against adverse movements of the exchange rate and production costs, linkages to the world's largest consumer market and exploitation of their own technological and managerial advantages (Davis, 1993). The recent decline in the movement of production facilities and other direct investment, during the early 1990's, is during a period of lower current account and trade deficits, a more stable U.S. dollar, and weaker economic activity for the U.S. and investment source countries (Davis, 1993).

With the rise of foreign ownership in U.S. companies came the fear that U.S. land, resources and technology would be controlled by foreigners. The reverse has happened by allowing small towns to compete in a world economy, expand

technologies and find employment. Foreign owned companies bring money to local markets and bring new ways to manage, produce, train for and use technology.

In the 1990's, the rate of new investment peaked and is currently declining. In the 1980's, Japanese plants in Illinois, Indiana, Kentucky, Michigan, Ohio and Tennessee created more than 100,000 manufacturing jobs (Larson, 1992).

It is becoming increasingly difficult to draw a clear line between what is domestic and what is foreign. The internationalization of domestic producers has occurred simultaneously with the domestication of foreign producers and transplants. Efforts have been made to inform the consumer of foreign content of such products as automobiles and trucks. However, trying to discern between what is foreign and what is American will become even more futile in the future (Harvey, 1993).

STATEMENT OF THE PROBLEM

The Manufacturing Sector

To further focus the problem, this research could go in one of three directions. Its emphasis could be directed to the service sector, manufacturing sector or both. This researcher has determined that the manufacturing sector provides a greater need for study due to its global

importance, technological emphasis, and its relative decline over the past decades. Also, our relative standard of living is directly attributable to our ability to compete globally in manufactured products.

The manufacturing sector of the U.S. economy has been consistently decreasing in size relative to total gross domestic product since the 1950's. Many economists argue that de-industrialization is simply a stage in economic development. Great Britain has experienced a rapid decline in its manufacturing base which requires immediate action to avoid a disaster (Healy, 1994). Healy indicates that such action by the British government must include:

- Provision of low inflation and interest rates as well as stable exchange rates.
- Increase in government funding for research and development.
- Allowance for accelerated depreciation on manufacturing investment.
- Provision of tax relief for vocational training.
- Encouragement of alliances between manufacturing companies and educational institutions.

Mattera (1991) believes that lowering interest rates to initiate an economic recovery in the U.S. ignores the

importance of the manufacturing sector and fails to call attention to the depth of its fall. We can look at 1950 and 1992 to illustrate the depth of the falling manufacturing sector. In 1950, the service sector employed about 50% of all American workers and in 1992 had increased to 76%. In 1993 the share of manufacturing accounted for only 23% of gross domestic product (GDP) in the U.S. Carr (1993) uses a case study to highlight the importance of manufacturing policies as primary sources of sustainable competitive advantage.

According to the Economic Report to the President, from 1950 to 1990, Agriculture, Transportation and Manufacturing have had the highest productivity rates. These sectors have also had the largest job loss. In the past ten years, manufacturing payrolls have shrunk by 325,000. It has become increasingly important for those left in manufacturing to acquire high skill levels requiring extensive training.

There is strong evidence that American manufacturers are convinced of the need for training; however, some confusion exists regarding the means for meeting that need. Manufacturers are in the forefront of worker training and are responsible for a number of new training methods (Hill, 1994). According to Carol Brown, a project manager with the

American Society for Training and Development, manufacturers are committed to the total quality movement in response to intense competition from around the globe.

Such contemporary quality and training lingo as "TQM" and "reengineering" are applied to manufacturing first because the results are directly measurable, according to Joseph Thomas, a professor of Manufacturing at Cornell University's S.C. Johnson School of Management (Hill, 1994). When these prove successful in manufacturing, they get passed on to other areas. Given that manufacturing is somewhat forced to stay current in the latest training methods and total quality environments, this provides a final and compelling reason to select the manufacturing sector as an ideal area of research.

The Automobile Industry

The ten fastest growing manufacturing industries in 1994 are machine tools, electronic components, surgical appliances, mobile homes, automotive parts and accessories, medical instruments, lighting fixtures, mattresses, leather tanning and analytical instruments (Standard and Poor's, 1994). They are being propelled by U.S. demand for automobiles, computers, environmental and health equipment, and housing. Further refining the topic, the automobile industry will be the focus of this research due to its major

contribution to growth in GDP and due to the vast automotive resources available in Michigan.

The total global motor vehicle production in 1992 was 49.9 million units down to 48 million in 1993 (Wards Automotive Yearbook, 1994). The U.S. increased its world share from 19.5% to 22.7% during the same period. U.S. production levels in 1993 were 23.7% higher than 1991. The share of truck production rose to 45% in 1993. While U.S. Big Three producers (General Motors, Ford and Chrysler) increased their share of both cars and trucks, output at solely owned, U.S. located, Japanese plants was mostly down. Nissan was the exception with production units of 171,402 and 293,182 in 1992 and 1993, respectively.

Training in the automotive industry has been revolutionized in the past two decades. The transformation from production quantity to product quality and customer satisfaction has put a whole new emphasis on training. U.S. automobile manufacturers have been forced to reposition themselves in a rapidly changing marketplace. General Motors maintains high levels of corporate support for education (Sullivan, 1991). Saturn employees are expected to spend 5% of the hours they work each year in training (Vasilash, 1992).

In 1992, the Chrysler Corporation began a massive training effort to improve how its dealers handle consumers (Serafin, 1992). Ford changed the name of one of its divisions from Parts and Service to Customer Service while its focus became consulting and technical training rather than just selling parts to dealers (Woods, 1993).

Suppliers within the automobile industry have scrambled to meet the increasingly tough standards of car makers. Arvin North American Automobile designed its own quality program intended to empower employees and improve efficiency (Hitchcock, 1993). They reduced defects by 90% and lowered inventory levels by almost one-half. Form Rite Corporation, a supplier of tubular assembly products continuously strives to produce world-class products. Training workshops include formal classroom sessions, presentations and work site exercises. Form Rite earned the Ford Motor Company preferred quality Q1 award (Ardahji, 1993). Lucas Automotive Electronics Division provides continuous training and education with the primary objective of reducing defects in their electronic control units and other electronic devices (Anonymous₁, 1993).

Training is also a major emphasis in American-Japanese joint ventures. The Sumitomo 3M joint venture in Japan, an automotive supplier of electrical parts, in 1993, was

spending more than \$2 million per year to train 3000 employees (Anonymous₂, 1993). Their 1993 training program included:

- Computer and technical skills.
- Basic selling skills to new hires.
- Marketing.
- Supervisory training for first-line managers.
- Training for general and plant managers.

The average annual hours spent on quality training in the U.S. automobile industry was high at almost every level and is expected to increase in the three years following a 1992 International Quality Study (IQS). The study found that the most benefit per training dollar could be derived from senior management and new-product development employees (Benson, 1992).

Some deliverers of training programs conduct studies of new technology and methods of learning. In 1993, Paulson Training Programs chose Westplex Corporation of Manchester, New York and Team One Plastics Company of Albion, Michigan to participate in a multimedia interactive training system. This system uses a personal computer and laser videodisc to create a private learning station (Kirkland, 1993). Both companies serve 2nd-tier automotive suppliers; however, Team

One almost exclusively serves the 2nd-tier transnational Japanese automotive suppliers.

Many more examples of Japanese and U.S. training programs could be cited and are abundant in the literature. However, this research will focus on direct comparisons of Japanese and U.S. companies to provide useful information regarding their processes, strategies and outcomes.

PURPOSE OF THE STUDY

The purpose of this study is to identify key similarities and differences in training processes, strategies and outcomes as conducted by U.S. located Japanese and American automotive industry suppliers.

The total number of automobiles produced in the U.S. by Japanese transplants increased from 1500 in 1982 to 1,540,277 in 1993. Along with the major Japanese automobile manufacturers came hundreds of smaller 1st and 2nd tier suppliers whose training programs have received little attention in contemporary research. Some transplants have recently announced increases in plant capacity and output to further reduce costs and achieve greater economies of scale. Also, the Japanese are turning more design and engineering over to U.S. research and development facilities.

It is apparent that the presence of Japanese transplants in the U.S. will increase and it is imperative that research be conducted which gives insights into their successes and failures. Quality and customer satisfaction are key reasons for their success and training is essential to maintain world-class quality and customer service.

RESEARCH QUESTIONS

The primary goal of this study is to determine key similarities and differences between Japanese and U.S. manufacturing plants in regards to training processes, strategies and outcomes. The specific area of training to be researched is the initial orientation phase when an employee is first hired or transferred from another position. Due to the inseparable link to recruitment and screening they will play a minor role in this research. Additionally, ongoing training will receive some attention when making direct comparisons to orientation training. Research questions were constructed around the processes, strategies and outcomes of initial training. The following research questions were identified:

1. How much emphasis is placed on the recruitment and selection of new production employees?

2. How much and what kind of training is required of new production employees?
3. Who is responsible for identifying training needs and how are these needs identified?
4. How much commitment and support does the organization give to its training program?
5. How is the training organized and delivered?
6. Can the effectiveness of training programs be documented, and how do companies evaluate effectiveness?
7. Who determines the training needs for the future and what process is used to determine these needs?
8. What role does Adult and Continuing Education play in these programs? (instructional design, evaluation, follow-up, etc.)

SIGNIFICANCE OF THE STUDY

This study will provide needed information to industry regarding the true relationship between training programs in U.S. and Japanese manufacturing plants. It will provide insight into the effectiveness of various degrees of training intensity as well as initial versus ongoing training and reveal the steps which must be taken if further training effectiveness is desired. Questions often asked by Human Resource Managers are "What is the payoff on my training dollars?" and "Should I increase or decrease my

investment in training?" Many training managers will benefit from this study as it gives them some tools to begin answering these difficult questions.

DELIMITATIONS OF STUDY

This study has the following delimitations:

1. The six plants researched which were selected by the identification of specific criteria.
2. The study was restricted to the geographical location of plants in the Midwest.
3. Selected plants were in the data base of the General Motors Purchasing and Quality Assurance departments. The majority of these plants are currently one of General Motors suppliers and are considered their "best" suppliers.
4. Early training which is received by new employees.

DEFINITION OF TERMS

Automotive Suppliers (2nd-tier): Suppliers of automotive parts to 1st-tier automotive suppliers who supply parts directly to final assembly automobile facilities.

Benchmarking: Comparing a firm's business practices with those used by world class companies, more recently associated with global competition.

Downsizing: Reductions of facilities and/or employees typically with the intention of reducing costs and enhancing global competitiveness.

Emerging Technologies: Higher risk technologies and associated products utilizing recently developed concepts whose long term survival is questionable. Typically, the development of these technologies is conducted in highly industrialized nations such as Japan, Germany and the United States.

Empower: Management gives employees the freedom to make important decisions and they are held accountable for these decisions. The theory is that the employee is closest to the product, hence, the most logical person to make changes to enhance product quality.

Foreign Direct Investment: The exchange of foreign investors money for some form of property such as securities or real estate.

Foreign Transplants: A multinational firm's plant located in a country other than its country of origin. (See appendix A)

Gross National Product: A statement of the distribution, at market prices, of goods and services produced in the national economy during a given year.

Gross Domestic Product: A measure of the output produced by factors of production residing in the United States.

Information Highways: The idea of bringing information sources through telephone, cable and other high technology communication networks.

ISO 9000 Series: A set of 5 international standards developed in Europe concerning quality management and quality assurance.

Local Subsidiary Sales: Multinational company sales in a country other than its country of origin.

Market Power: The degree of influence a firm has over the price of goods or services directly attributable to its market share. There is a direct relationship between market share and market power.

Multinational Company: A company which operates in many countries other than its country of origin.

Productivity Rate: The change over a period of time in output obtained from resources expended. Example: using fewer man hours to produce the same product quantity indicates an increase in the productivity rate.

Reengineering: A complete upheaval of an organization with the idea of changing the culture of that organization. Example: Encouraging an integrated cooperative approach to management instead of a compartmentalized bureaucracy.

Saturn: A new division of General Motors producing small entry level automobiles. The intention is to produce world-class cars in a revolutionized manufacturing environment. Saturn dealers are separate facilities where customer service has been given special attention.

Total Quality Management: A management approach designed to help companies achieve better employee relations, higher productivity, greater customer satisfaction, increased market share and improved profitability.

Trade Barriers: Tariffs, quotas or other means of discouraging a foreign firm from exporting its products into the country responsible for the trade barriers.

Trade Deficit: The excess of a country's imports over exports.

Training: In general, practical activities designed to effect sustained behavioral changes.

In-house training: Employer sponsored training except for formal apprenticeship. Training may be on-site or off-site.

Outside Training: Non-employer sponsored training such as community college courses. Training is initiated and paid by employee.

World-class Quality: A level of quality which enables a firm to compete in a global marketplace among other world-class competitors.

CHAPTER II

REVIEW OF RELATED LITERATURE

INTRODUCTION

To examine training literature, Human Resource Management must be examined. The major human resource functions are planning, recruiting, training, compensation, employee relations, labor relations and organizational development (Gordon, 1986). Training and development programs focus on three areas: Orientation, Training, and Management Development.

Training, as defined by Nadler (1980), is those learning experiences provided by the employer to improve performance on the present job. He stated that education is learning for the purpose of preparing the employee for future positions. Nadler (1980) also says that development is oriented toward long-term planning to equip employees to move in the general direction which the organization plans to go.

NEW DEVELOPMENTS IN TRAINING

"Beginning in the 1980s the distinctions among types of training began to blur, the scope of training expanded, and connections grew among the parties-employers, workers,

educators, and governments (Ferman, Hoyman, Cutcher-Gershenfeld, and Savoie, 1990). They have identified ten forces that driving changes in training that include: (1) globalization and specialization; (2) changes in the structure and identity of corporations; (3) new ways of organizing work; (4) strategic choices of the firm; (5) changes in the labor force; (6) new technology; (7) new recognition of literacy problems; (8) deindustrialization and concomitant displacement of workers; (9) skill inflation for entry-level positions; and (10) public realization of the connections among training, economic development, and competitiveness.

As a result of the above forces, many emerging themes (Ferman, et al, 1990) have developed in worker training that include: (1) training has been expanded to all workers, especially blue-collar; (2) career opportunities have become a major reason to train; (3) training is critical for improved economic development and enhanced competition; (4) a general set of governance issues emerge as multiple interests are applied to training; (5) new opportunities arise as unions and management establish joint training programs; (6) many new participants are becoming involved in training; (7) complex challenges involved in displaced worker training; (8) Acknowledgement of the need to upgrade

basic skills; (9) Availability of traditional management classes to all workers; (10) new technology serves as the driving force for training; (11) shifts in federal policy toward disadvantaged and hard-to-employ workers; and (12) new training developments at the state level.

The Japanese have greatly contributed to new developments in worker training, especially because they have expanded training to all workers and have been in the forefront in advanced manufacturing technologies. "Just-in-time inventory systems, statistical process control quality programs, quality circles and the like require different types of skills than traditional U.S. production situations where jobs have been structured to require relatively little training" (Fossum, 1990). Fossum (1990) explains that statistical process control and just-in-time inventory systems require a much higher level of mathematical education than most U.S. production workers or their supervisors possess. In Japan, production employees receive more training through job rotation, classroom development sessions, on-the-job tutoring, and corporate culture (Weber, 1984).

CULTURAL DIFFERENCES

First, to examine differences between American and

Japanese management systems, one must discuss the group versus the individual. The U.S. pattern of personal identification is primarily as an individual and then as part of a larger group. "The Japanese are primarily part of some larger group such as family, school, work and nation" (Condon, 1984). He points out some major differences between U.S. and Japanese management styles (Table 2.1).

Table 2.1
Different patterns in U.S.
and Japanese management styles

Theme	U.S. Pattern	Japanese Pattern
personal identification	individual	group
promotion	merit, move upward	seniority, horizontal movement, lifetime employment
communication channels	direct w/equals indirect with subordinates	direct & frequent contact w/all levels
communication style	explicit, verbal speaking	implicit, non-verbal writing, reading
decision making	top-down, quick, vote, consensus	upward, slow, discuss then consensus
conflict confrontation	direct & frank	to be avoided
social interaction	spontaneous & novel	predictable & ritualized interaction
family & work loyalties	family over work	work over family
time orientation	present & immediate future	past, present & future (long term)

In Japan, training patterns are continuous, primarily on-the-job oriented, and include more lateral training which is included across functional lines. The system assumes that workers are not trained for a specific job (Dunlap, 1986). In Japan, three primary classes of workers exist. They are the shokuin (person in charge), the koin (person who works) and temporary workers.

JAPANESE COMPANIES IN THE U.S.

Janis Dunlap (1986) conducted interviews with ten American Human Resource Development (HRD) specialists employed by Japanese owned and managed companies. The companies were located in California, North Carolina, and Texas. She determined that Japanese companies in the U.S. are as different as American companies. They are influenced by time of founding, type of company and type of industry.

The time of founding in many instances determines the system of Human Resource Development (HRD). Dunlap states,

American based Japanese companies founded during the 1950's through the 1960's tend to operate more like traditional American companies while those established in the United States during the 1970's and 1980's more nearly approximate Japanese methods of management and Human Resource Development.

She also says the type of company has an affect on HRD. Marketing companies are patterned after American companies.

Service companies seem to blend American and Japanese styles. Manufacturing companies established recently are run more like Japanese companies.

Dunlap stated that industry type has an effect on HRD. Construction and industrial manufacturing industries have a pure Japanese style. Chemical and banking industries are a blend of Japanese and American styles. The consumer goods industry uses a traditional Japanese style, but is making some changes. The automobile industry has typically followed the American style. However, Dunlap (1986) asserts that as more Japanese plants move into the U.S., the cultures tend to be more blended.

CONTRASTS BETWEEN JAPANESE AND AMERICAN TRAINING

Dunlap (1986) interviewed training specialists and determined the following: During training sessions American firms have a representative from Personnel visit the group; In Japanese companies the President visits the plant and sometimes visits training groups.

Dunlap has shown that Japanese plants train in areas sometimes unrelated to the product simply to help employees form relationships. However, her research shows that these attempts to develop interpersonal relationships were not received well by American workers. It could be reasoned

that American workers are more comfortable with training when it is highly relevant to their tasks.

In many Japanese companies an initial training period is required before employers make their final hiring decision. An evaluation is completed and a recommendation is then made by the trainers.

Dunlap states that her interviews revealed that initially, American companies train from the technical side to a greater degree. Japanese companies sometimes spend an entire day on culture and/or management. In Japanese companies, technical skill training appears later in the training process. This training also takes place consistently and for the remainder of the employee's term of employment with the company.

Dunlap's study indicated that regardless of time of founding, industry or type of company, Japanese companies based in the U.S. have a high regard and commitment to high levels of skill training.

Another training example in Dunlap's research contrasts number and letter processing. In American companies, a memo may be generated requesting the workers write more legibly. In Japanese firms, an exercise sheet would be sent to the workers, to provide rote training. In Japanese companies, the position is taken that everyone starts at a level of

zero knowledge. In American companies people are typically hired based on previous training and knowledge.

Dunlap (1986), points out that Japanese companies commonly use group meetings and on the job training to provide technical training. Some Japanese companies have no formal training rooms. They instead have teams that work, share and learn together.

Dunlap's study also indicates that the source of training material appears to be dependent on industry and company types. For example, most Japanese firms located in the U.S. use materials that come from the parent company in Japan, while the banking industry uses internally generated materials.

According to Dunlap, management training in Japanese firms vary by time of founding and type of industry. The primary difference between Japanese and American management training is the larger degree of orientation training and cultural training in Japanese firms. In those founded during the 70's and 80's, cultural training was accomplished by sending American managers to Japan. Japanese firms established in the U.S. before 1970 typically do not include cultural training in their management training programs.

Salas (1984) states that Japanese companies in the U.S. need skills in cross-cultural education, training and

development. He says that they must cross those cultural, national, ethnic and other barriers. Further, he indicates that they use international foreign-based trainers to provide training in the U.S. He states that an international foreign-based trainer is one who works for a multi-national corporation to instruct line employees of the corporation in a foreign country or instruct host country executives in corporation operations.

HISTORY OF JAPANESE VS U.S. MANAGEMENT SYSTEMS

A great deal of attention and research has been centered upon Japanese automotive companies over the last several decades, especially beginning in the 1980's, as global business has increased. The successes of Japanese companies in the 1980's has given researchers reason to study Japanese management styles (Koya and McMillan, 1981, Hatvany and Pucik, 1981). Many researchers have compared Japanese management with American and European management styles (Ouchi 1981, Buckley and Mirza 1985, Pascale and Athos 1981).

Pascale and Athos (1981) used a model developed by the McKinsey Company which includes seven components: Superordinate goals, strategy, systems, staff, style and skill (training and developing the people). Pascale and

Athos claim that Japanese organizations have integrated these seven components more effectively than American organizations. They claim that staff, style and skills ("the soft s's") are the three areas where Japanese companies have an advantage due to their emphasis on the human element (Refik and Kucukemiroglu, 1993).

Ouchi (1981), in *Theory Z*, identified seven major characteristics of Japanese organizations, including lifelong employment, lengthy evaluation and promotion processes, little specialization in careers, implicit control mechanisms, participative decision making and responsibility, and a paternal concern for employees. He contrasts this with American organizations, claiming that these characteristics are less prevalent.

In 1984, in the *M-Forum Society*, Ouchi elaborates on close relationships between government, labor, financial institutions and industry to fine tune a highly developed industrial strategy. He has been criticized for his relatively small sample size and limited interviews.

MODERN JAPANESE PRODUCTION METHODS

The Japanese are known for innovations such as *andon* (similar to a traffic light on the production line), *poka-yoke* (fool-proofing), *just-in-time* (an inventory control

system to reduce carrying costs), *kanban* (a simple and direct form of communication right where it is needed), the *five S's* (organization, neatness, cleaning, standardization and discipline), and the *Toyota production system* (machines are located where needed and parts available when needed).

Taiichi Ohno developed the Toyota production system over 30 years ago because of the desire to increase production efficiency by consistently and thoroughly eliminating waste. There are two major components of the Toyota production system. One is just-in-time and the other is *autonomation* (Ohno, 1988). *Autonomation* means automation with the human touch. Toyota emphasizes *autonomation*, machines that can prevent problems "autonomously", over simple automation (Ohno, 1988). Allowing production workers to stop machines when problems occur follows the theory of *autonomation*.

The five whys evolved from the Toyota production system. Simply stated, when confronted with a problem, an operator should ask why at least five times, each time more clearly, until the root problem is found (Ohno, 1988). Another vital part of the Toyota production system is *kanban*. Ohno (1988) states that *kanban* is an operating method usually contained on a rectangular vinyl envelope. He says there are three types of information on this envelope

that include (1) pickup information, (2) transfer information, and (3) production information.

Another Japanese concept that has received recent attention is the 5S movement. The name comes from five Japanese words, *seiri*, *seiton*, *seiso*, *seiketsu*, and *shitsuke*. The English translation for these five words are organization, neatness, cleaning, standardization and discipline. When the 5S's go bad, it usually means there is something more fundamentally wrong (Osada, 1991). Osada (1991) asserts that the problems are not because the 5S's are not being observed. Rather, he says, it means that you have delivery, quality, or other additional problems which cause interpersonal problems. As a result the 5S's are being neglected. Osada (1991) gives the following descriptions of the 5S's:

Seiri-Organization - To distinguish between the necessary and the unnecessary, to make the hard decisions and to implement stratification management to get rid of the unnecessary.

Seiton-Neatness - Having things in the right place or right layout so they can be used in a hurry. It eliminates searching.

Seiso-Cleaning - Getting rid of waste, grime, and foreign matter and making things clean. Cleaning is a form of inspection.

Seiketsu-Standardization - Continually and repeatedly maintaining your organization, neatness, and cleaning.

Shitsuke-Discipline - Instilling the ability to do things the way they are supposed to be done.

TRAINING AS KNOWLEDGE

The study of training involves the creation of knowledge. Recently, the subject of knowledge has been in the business press. Peter Drucker (1993) makes reference to the "knowledge society" and claims that knowledge is the only meaningful resource. Alvin Toffler (1990) says that knowledge is the essence of power and that is why a battle is brewing over the control of knowledge or communications. James Brian Quinn (1992) believes that intellectual and service capabilities are key sources of power for a modern corporation. Robert Reich (1991) contends that knowledge in key areas are the only means for true competitive advantage.

As these Western authors battle for their edge in the debate over knowledge, two Japanese authors, Ikujiro Nonaka and Hirotaka Takeuchi, use knowledge to illustrate the key to Japanese success. Nonaka and Takeuchi (1995) contend that the performance of the Japanese can be linked to their ability to create knowledge and use it to produce successful products and technologies. They differentiate between explicit, which is the Western focus, and tacit knowledge, which is the focus in Japan. According to the authors, explicit knowledge is contained in manuals and procedures, while tacit knowledge is communicated indirectly by metaphor and analogy. The real key is the ability of the Japanese to

convert tacit knowledge into explicit knowledge (Nonaka and Takeuchi, 1995). The authors contend there are two segments to tacit knowledge, the technical and cognitive dimension. They liken the technical dimension to a master craftsman who has acquired much knowledge but finds it difficult to articulate technical principles. According to the authors, cognitive dimension is the way we perceive the world around us. Nonaka and Takeuchi suggest that these mental models, perceptions and beliefs are so ingrained in our minds, they become a part of us. Today, training is basically creating knowledge so workers can learn to go beyond their routine jobs and find ways to improve productivity and quality. In this research, knowledge is the outcome of training, and the creation of knowledge is a shared responsibility.

SUMMARY

The focus of this research is to observe training programs for production workers in Japanese and U.S. automobile supplier plants. Chapter two has outlined the pivotal research in the areas of training, culture, management, production and knowledge. Chapter three will examine the methods of research including the questions, selection of research sites, criteria, approvals, interviews and data analysis.

CHAPTER III

RESEARCH METHODOLOGY

INTRODUCTION

This chapter contains descriptions of recruitment methods and techniques, administration of interview guides used to collect data, and procedures used to analyze the data.

The purpose of this study is to explore and identify similarities and differences in training processes, strategies and outcomes between U.S. located Japanese and American automobile industry suppliers.

A summary of the sequence of events regarding the methodology and design of the research is included in Appendix B. It details five stages which include recruitment, verification, approvals, interviews and the analysis of data. Essentially, it is a step by step sequence of events from the planning stage to the analysis of data.

RESEARCH QUESTIONS

Research questions were constructed around the processes, strategies and outcomes of training. Appendix C indicates how sub-questions of the following research

questions are associated with the above three training concepts.

The following research questions were identified:

1. How much emphasis is placed on the recruitment and selection of new production employees?
2. How much and what kind of training is required of new production employees?
3. Who is responsible for identifying training needs and how are these needs identified?
4. How much commitment and support does the organization give to its training program?
5. How is the training organized and delivered?
6. Can the effectiveness of training programs be documented, and how do companies evaluate effectiveness?
7. Who determines the training needs for the future and what process is used to determine these needs?
8. What role does Adult and Continuing Education play in these programs? (instructional design, evaluation, follow-up, etc.)

While the above eight questions are the fundamental research questions for this study, Richard B. Frantzreb, editor, in Training & Development Yearbook, 1994/1995 presents a clustering of six categories which can provide a

basic framework which supports the researcher in asking more targeted questions. He organizes the important topics of Training and Development as follows:

- ▶ Training Administration
- Program Design, Development and Implementation
- Training Technology
- Trainers and Trainees
- Training Techniques
- Training Programs

These six categories were used to provide a basic framework for the questions and sub-questions that follow. This format was used for the interview questions to provide generally recognizable training categories. General questions are immediately followed by more specific sub-questions.

1. How is training orientation administered?

1a. How is training funded and how is it allocated?

1b. What is the source of your training budget? Who supports training?

1c. Are the outcomes of training benchmarked to other facilities and competitors? How?

2. What are the specifics of the design, development and implementation of the training program?

2a. How do you conduct a needs analysis for training?

2b. How do you go about designing instructional

- programs?
- 2c. What is the origin of instructional materials?
- 2d. How is training evaluated and what is done to link training to some measurable outcome?
- 2e. How do you make training directly transferable?
- 3. How is technology used in initial and ongoing training?
 - 3a. To what extent do you use computer based training?
 - 3b. How is technology used for training?
- 4. What are the characteristics of the trainers and trainees?
 - 4a. Trainer characteristics
 - 4a1. Are professional trainers used?
 - 4a2. Are non-trainers used in training roles?
 - 4a3. How do trainers motivate trainees to learn?
 - 4a4. Are trainers used internationally or only in the U.S.?
 - 4b. Trainee characteristics
 - 4b1. What level of education have trainees attained?
 - 4b2. How do trainees learning styles differ?
 - 4b3. What is the average length of service?
- 5. What training techniques are used in the program?
 - 5a. Which classroom techniques are used?
 - 5b. Does experiential learning have a place in your training program?
- 6. What kinds of training programs are offered?
 - 6a. What characteristics does your skills training program have?

6b. Do you actively integrate career development into training?

SELECTION OF RESEARCH SITES

The groups studied were wholly owned Japanese or U.S. manufacturing plants which met the researcher's predetermined criteria listed below. In Michigan alone, according to the Michigan Department of Commerce, there are at least 170 automobile related companies with a Japanese parent company.

The two evaluated groups are three U.S. and three Japanese automotive supplier plants in the Midwest. These firms were selected based on the researcher's criteria as listed in the next section.

The purpose of studying these two groups was to allow the researcher to develop central themes which were used to evaluate processes, strategies and outcomes of the respective training program.

CRITERIA

The following criteria were used to select the six manufacturing plants which were interviewed in this research:

1. Three are wholly owned by a Japanese firm and the remaining three are wholly owned by a U.S. firm.

2. All plants are automobile parts suppliers.
3. All plants provide a level of quality and service placing them in the top tier of automobile manufacturers.
4. Each plant has no more than 1000 total employees.
5. The plants are located in the Midwest for convenience to the researcher.

RECRUITMENT OF AUTOMOTIVE SUPPLIERS

Initially, contact was made with the Director of J Car Planning, Program Quality Implementation Department at General Motors. The Director of J Car Planning contacted his purchasing department with instructions to develop a list of suppliers that meet the above listed criteria. The purchasing department provided basic information including, but not limited to name of company, address, phone number, contact person, number of employees, products manufactured, basic training details and level of quality based on General Motors criteria.

VERIFICATION PROCESS

The researcher located each company on the provided list to verify basic criteria and to obtain further details regarding training, finances, human relations, ownership and products manufactured. The basic information was obtained from the Michigan Manufacturers Directory, Standard and

Poor's Industry Guide, and Value Line Company Index.

SUPPLIER APPROVAL

All suppliers were contacted in writing to describe the study and ask for assistance. Once they received the letters, the appropriate contacts within each firm were telephoned by the researcher, who further explained the purpose of the research along with actual and potential benefits and time requirements. Appointments were scheduled with those suppliers who agreed to be interviewed. Six manufacturing plants were chosen for a personal interview to obtain information about their training programs. An eight hour appointment was scheduled with the training coordinator or other knowledgeable individuals. In some cases, the sessions were separated into smaller time segments.

Following the oral scheduling, a follow-up letter was sent to confirm the appointment day and time (appendix D). The researcher called each of the interviewees prior to the scheduled date to confirm and to ask a few basic questions (appendix E). This saved time and allowed the researcher to better prepare for the interview process.

POPULATION AND SAMPLE-INTERVIEWEES

Three ranks were selected in each plant consisting of

top level managers, trainers and trainees working for companies that meet the basic criteria. Since General Motors was providing the initial list of plants, the population was limited to General Motors suppliers who met the basic criteria for selection.

Top management interviews were limited to Human Resource Managers and/or managers who were highly knowledgeable in the hiring and training processes, strategies and outcomes of non-technical production employees. Trainer interviews were limited to those trainers providing non-technical training to production employees. The trainee interviews were limited to technical, non-technical or general production employees directly employed on the production line.

The use of three ranks within each group enabled the researcher to verify similar questions to check for consistency and accuracy. Also, some questions could only be answered by one or two of the three subgroups.

THE INTERVIEW PROCESS

Three separate interview guides were administered, which were designed for managers, trainers and trainees. These guides (exhibits F, G and H) provided the basic framework for each interview session, which lasted

approximately one hour each. The three interview guides were developed by the researcher. During the interview, it was orally explained that any information obtained during the interview would be presented such that the interviewee and company name would not be revealed directly or through an indirect reference. It was also explained that participation in all phases of this research was voluntary.

After consulting several sources for survey instrument construction, the following revised checklist was developed using "The Graduate Students' Guide to Theses and Dissertations, A Practical Manual for Writing and Research" by George R. Allen. (Allen, pp.52-55):

1. *Attempt to reduce time required to complete interview.*
2. *Omit personal information if not necessary.*
3. *Pretest the interview.*
4. *Word questions simply, clearly, briefly and as straight forward as possible.*
5. *Avoid "central tendency" response.*
6. *Include demographic data if appropriate and relevant to research.*
7. *Relate each question to the purpose of the research.*
8. *Anticipate what will be done with the data.*
9. *Carefully consider the sequence of questions.*
10. *Build an internal-consistency check into questions*

if possible.

11. *Put yourself in place of respondent.*

At each of the six plants, a minimum of three upper level managers, one trainer and eight trainees were interviewed. Trainees were interviewed in groups. Group interviews saved time and provided for discussions. In all plants, with approval, the interview sessions were tape recorded.

DATA ANALYSIS

The researcher compiled the results from each plant and separated the responses into two groups, Japanese and U.S. manufacturing plants.

Data obtained from each plant was clustered around three central themes: training processes, strategies and outcomes. The entire group of Japanese suppliers was compared to the entire group of American suppliers.

While being a minor part of the research intent and held to a minimum, statistical analysis of quantitative data was completed using the Minitab statistic package. A ten question survey, included in Appendix I, was administered which uses a Likert scale from one to ten. Specific statistics include sample size, means, standard deviations, frequency counts, and the difference in sample means.

Qualitative data was compared as perceived by the two populations studied: Japanese transplants and U.S. plants. Some of the perceptions are parallel and some are orthogonal. This enabled the researcher to address the responses from different population samples with similar themes.

CONFIDENTIALITY

Any specific findings related to individual plants were crafted in such a way that the identity of the participants were protected. The subjects' identities are known only to the researcher and research aide. The summary of the research will be sent to all interested companies participating in the research. In the summary, a composite of the findings will be provided. Therefore, strict confidentiality was assured.

CHAPTER IV

FINDINGS

This chapter summarizes, and identifies similarities and differences in training processes, strategies and outcomes between U.S. located Japanese and American automobile industry suppliers.

The study consists of six case studies: three Japanese plants (transplants), and three American plants. Research questions were constructed around the processes, strategies and outcomes of training. Appendix C indicates how sub-questions of the following research questions are associated with the above three training concepts. The following research questions were identified:

1. How much emphasis is placed on the recruitment and selection of new production employees?
2. How much and what kind of training is required of new production employees?
3. Who is responsible for identifying training needs and how are these needs identified?
4. How much commitment and support does the organization give to its training program?
5. How is the training organized and delivered?

6. Can the effectiveness of training programs be documented, and how do companies evaluate effectiveness?
7. Who determines the training needs for the future and what process is used to determine these needs?
8. What role does Adult and Continuing Education play in these programs? (instructional design, evaluation, follow-up, etc.)

COMPANY A: AMERICAN OWNED

INTRODUCTION

The first supplier interviewed is a Midwestern manufacturer of both original equipment and aftermarket parts within the highly competitive automotive industry. The plant is located in an agricultural area nestled within a small rural town. At the end of 1994, it employed 675 people, of which 547 were production employees. They have operated in a union-free environment since their inception about nine-and-a-half years ago, and operate 21 plants in the United States. Their average worker is about 25 years old. This company supplies parts to General Motors, Chrysler, Peterbilt, Nissan, ASC, Toyota and Mack.

The company has a mission statement for training that reads, "To ensure that new employees are familiar with our procedures, properly trained to function within our process,

and fully understand the guidelines of our operation." Each major departmental unit has developed its own training outline. Many parts of the outline are identical, especially the procedures for a new employee. For example, process, quality concerns, safety issues, paperwork requirements and new employee introductions are all scheduled on the first day.

PROCESS FOR RECRUITMENT AND TRAINING

Recruitment and Selection Process

New production employees are required to have a high school diploma or General Education Development (GED) Certificate. The company does not require a test for basic skills, but does have a full interview process. A full interview process consists of two or more face-to-face interviews, a reference check, drug test and physical examination. They advertise positions and then screen applications based on driving distance, high school diploma or equivalency, wages in previous jobs, and post secondary education. There are two interviews, and about 25% of applicants are hired. Supervisors rotate through this interview process, because the company believes that it gives the supervisors ownership. The plant manager, personnel manager and production manager also participate in

the rotating interview pool.

The next step is a physical (medical) examination and drug screening. Simultaneously, past employment, education and background information is verified. This process may take two to three weeks.

Training Process

Applicants who are selected for employment, tour the plant, view operations and receive information regarding basic benefit packages. The new employee is informed about probation, goal setting, evaluation processes, safety issues, right-to-know laws and attendance policies. New employees receive up to three weeks of training, beginning with generic training for all production employees, and then specific training based on department assignments. Training also includes items identified by current employees as important; for example, some employees reported that the fire alarm was not recognizable to them. As a result, identifying the sound of this alarm was integrated into the new employee training program.

Employees who have been with the company do not receive formalized "repeat" training. However, when employees are assigned to different departments or changing technologies, they receive specific training as needed. Current employees are also used to facilitate production training, and then

made accountable for the outcomes. Accountability is achieved by making production trainers responsible for improvements in trainees' quality and productivity.

This company is currently transferring one of its production lines from a semiautomatic operation to a robotics line. The plant manager mentioned that he sent supervisors, a manager and some maintenance people to Europe to observe this new system in operation. He has decentralized power and has given workers ownership in the project.

Before 1991, this company was experiencing a high employee turnover rate, which prompted a series of changes including the current training program. This current system is a dynamic one, where production employees are used as trainers. It is driven by the needs of the customer, changes in product and changes in expectations. For example, if customers identify quality problems, then all aspects of training are addressed to remedy the problem. The people on the floor will make suggestions and the trainers will carry out changes in training.

According to one departmental superintendent, teaching company philosophy is not limited to the first day. At least once during each day of the training period, each new employee is removed from the floor to discuss company

culture or philosophy. Several training rooms are located in the center of the plant and are used for training classes, meetings, film viewing and general discussion. The trainers for the three primary departments meet once or twice a month to discuss concerns, changes, problems and plans for the future.

STRATEGIES

New Hire Strategies

The idea of using different people in the pool of interviewers is to give every supervisor, department head and manager a sense of ownership. Pushing the decision making process down to those who work closely with the production workers is viewed as beneficial since they know what kind of person is needed for the position. They hope that screening out applicants who live too far away, do not have the proper level of education, and earned substantially more in a prior job will reduce turnover. Constant improvements in the training program and a major change in shift schedules may also be driving turnover down. Their current turnover rate is 40% (as of October-November 1994), down from 60% earlier in 1994; this rate has been as high as 80%. When the employees who leave during the probationary period (the first five months of employment) are removed

from the statistics, the current turnover rate is 20%.

Orientation/ New Hire Training Strategies

The philosophy of this company is that training is a top priority with commitment at all levels of the organization. One of the department trainers mentioned that training is constant for 11 1/2 hours a day, for eight consecutive days. This does not include orientation training. The Plant Manager made the following statement: "The reason we have this type of training program is because what we did in the past was not working, so we've seen the negative side of a lousy training program." Prior to these major changes in training, an employee would go right onto the floor without any formal training.

The company culture is an important part of the initial orientation. Management wants production employees to understand why decisions or changes are made. To understand the culture, it is reasoned, will improve attitudes and give employees a stake in the company. Plant tours are completed to expose new employees to all operations, to endow a sense of oneness, and to help them realize that their mistakes affect others down the line.

Using hourly trainers instead of salaried managers is intended to give the new employee someone closer to his or her position and someone well prepared to train in a

particular operation. If a new employee is slow at the beginning, the trainer picks up the slack. The trainer carries the ball, so to speak, until the new employee feels confident and comfortable with the job.

The new employee is not given a job classification. That is because anyone can operate various machines and learn many different skills. This makes job classifications unnecessary. Actually, the attitude of the newest trainees is that everyone is equal and team work is at the heart of this company. This feeling of decentralization and empowerment is nurtured and maintained from the very first day at work. All interviewees replied that their contribution and importance to the company were equal to that of the plant manager.

Ongoing Training Strategies

Once the new employee is trained, additional training is given when a new process begins or when an employee switches departments. However, one trainee indicated that training continues in an informal sense even after the initial three week period. The senior employees were given the opportunity to receive training in their departments when the new training program began in 1991. Some have taken advantage of the new training, others say they have not been able to leave the production line, and a few have

no interest in receiving the new training.

Another strategy of all aspects of training is keeping the trainers well informed and equipped to handle the task. One trainer said, "When I, as a trainer, have to keep things organized, management supports me by always being available." One department superintendent stated, "I think we've done a good job of explaining in detail how certain skills ought to be taught, how to complete certain techniques and how people should do certain jobs."

Miscellaneous Strategies

One strategy for improving problem areas in production is to send production workers to other plants. They can see what is being done in training and other areas. Typically, the plants chosen are those that have had a similar problem but have corrected it.

They also have a training committee on each shift for each department. The department supervisor attends all training committee meetings for his/her shifts and the trainers within the department also attend committee meetings.

OUTCOMES

Benchmarking

Within the parent company, many of the automotive plants are using this researched plant to benchmark. This

plant is a leader in the area of training, so personnel come from other plants to observe and compare. Prior to 1991, they had unsuccessful new hires, high turnover, quality problems and reactive management. When they brought in new people, they had to "sink or swim." Resources were being wasted on interviews, physicals, and other new hire costs. They came to the conclusion that a major change was needed. So, the whole program was developed internally where production employees developed training manuals, training outlines, actual training, check-off lists, tests and films. A trainer suggested that there were many people who would not be working in this plant if the new training program was absent.

Attitudes

Some older workers were intimidated by the abilities of the newer workers. They were encouraged to go through the training program after it was implemented in 1991. One trainee suggested that the training improved confidence levels and said, "You become a better employee, I think, over the long run, because of your confidence level." The plant manager stated, "The older employees are seeing a high degree of confidence, success rates and they are extremely satisfied with their quality, and quantity of outputs that new hires are capable of after a short amount of training."

Other comments include: "Compared to other companies, this training is second to none." A trainer mentioned that new hires are getting a lot quicker and are able to meet customer goals. This has boosted morale among all ranks.

Quantitative Outcomes

While difficult to capture, quantitative outcomes are improving at this plant including higher yields, lower scrap rates and fewer accidents. A typical comment by supervisors was, "The people coming off the training program are performing better than people who have been out on the floor for six, eight or ten months." Many senior employees had asked to go through the program.

To better facilitate the effectiveness of training, an evaluation takes place after two and five months. The evaluation is based on a number of given attributes: quality of work; quantity of work; leadership skills; and initiative. The employees output is benchmarked relative to a standard set of expectations.

The turnover or failure rate among new hires has been significantly reduced. Prior to 1991 this rate was 80%; in the last months of 1994 it was 40%.

Quality scores from customers have improved steadily since the new training was implemented, including

efficiencies in yields and parts per man-hour without defect.

Miscellaneous Outcomes

One production employee compared this company to a Japanese transplant. He indicated that this program was the best he had seen. A woman who grew up in Germany felt that this company was more like German plants, and indicated that it was advanced for a U.S. Plant.

SUMMARY OF COMPANY A FINDINGS

The following items summarize those characteristics regarding Company A that provide a basis for comparisons:

- The recruitment process is not overly intensive but meets minimum requirements including some testing and sporadic background checks.
- Their training process seemed quite comprehensive including orientation and several weeks of on the job training. When employees are transferred for the first time to another department, they receive the entire training package regardless of their seniority.
- Company A, with an earlier employee turnover rate of 80%, has achieved some dramatic reductions. By pushing decision-making downward, implementing new training

programs, and giving ownership to employees, the company has achieved a turnover rate of 40% in 1994.

- Hourly employees are used as trainers to bring management and hourly employees closer together in a harmonious relationship.
- Job classifications are avoided to give a sense of equality and team work.
- Some production employees are sent to other plants to observe training and production.
- Company A is used by many plants within the parent company as a benchmark. Many personnel from other plants have come to observe Company A.
- Employees are evaluated after two and five months relative to a standard set of expectations. These expectations include quality, quantity, leadership and initiative.

COMPANY B: AMERICAN OWNED

INTRODUCTION

The second supplier interviewed is also a Midwestern manufacturer of automobile parts and components. This company offered two plants for review, both in a rural setting located a considerable distance from a large city. On the date of the interview the first plant had 324 hourly

employees while the second one employed 311 hourly people. Salaried workers make up about 15% of all employees. The first plant operated under a union contract while the second plant was non-union. The parts produced are primarily mechanical and electronic switches and controls. Both plants were built in the late 1960's with several additions in the 1970's and 1980's. They have recently been hiring as sales have been increasing. The average age of all employees is 41. The company operates seven domestic plants. From this point, the first plant interviewed will be referred to as Plant B-1 and the second plant will be Plant B-2. When a specific plant is not indicated, comments will refer to both plants.

PROCESS FOR RECRUITMENT AND TRAINING

Recruitment and Selection Process

This company does not require a high school diploma or GED. However, most of their production employees have graduated from high school or obtained a GED, and a few have taken college courses. A basic skills test is not required but Plant B-2 required a dexterity coordination test. The process for application for employment at both plants was unclear. The Human Relations Department stated that the prospective employee is screened by a personnel agency,

while the employees interviewed stated that their application was made at the unemployment office or direct to the plant office. Only truck drivers are given drug tests and past employers are verified for all new hire candidates. Most employees go through one or two interviews often with the same person. The department supervisors typically interviews prospective new hires for their department.

Orientation and Training Process

The orientation process at Plant B-2 is as follows: The first day consists of a two hour orientation, a quality/charting discussion and then they begin training in their department. The two hour orientation consists of a handbook review, safety rules explanation, paperwork requirements, work schedules, general information and a plant tour. The quality control chart discussion is led by the engineering supervisor to give a basic overview in recognizing problems. Finally, new employees begin to work in four hour increments on two different work stations until they master both jobs. This will continue until all the jobs in their department are mastered. Training and work performance are reviewed daily, weekly, monthly, bi-monthly - which is the initial review period; and yearly, which is called the performance appraisal.

In addition to the above training, a quarterly cross training update is initiated by the supervisor. Annually, right-to-know and statistical process control training are updated. The initial training period can take from one week to several weeks depending on the number of work stations on the production line. Some of the differences between Plant B-1 and B-2 appear to be because B-1 is a union plant, and the contract specifies that experimentation is to be limited. Both plants use cross training in a compressed time period. One major difference is that in Plant B-1, new hires have a joint orientation meeting with the United Auto Workers (UAW) and management, where they talk about working relationships. Plant B-1 has an apprenticeship program for skilled trades in the plant. Some machinists are sent to the East coast and to Chicago for new equipment training.

Starting in 1995, these plants will implement training that complies with an international standard for training called ISO (for International Standards Organization) 9001. The specific purpose that coincides with ISO 9001 element 4.18 is as follows: "To identify the methods to be used to determine training needs and then provide the training for those personnel assigned tasks which have a direct effect on product quality."

STRATEGIES FOR HIRING, ORIENTATION AND TRAINING**New Hire Strategies**

The ISO coordinator commented on strategies for hiring new production workers. He said: "We hire individuals who have the experience and/or training to communicate, work on a team, and be committed to something more than just coming and spending eight hours a day. They need to make us more competitive and (to) continue improving." He also suggested that new hires be encouraged to work in a team environment, and be trained to think and contribute to the job.

At Plant B-2, supplemental help, which has been used quite extensively, is handled by an outside contractor. Their goal is to have 20-25% of the work force as supplemental. Due to the volatile cycles in the automotive industry, the ability to release the entire supplemental work force within one day gives them extreme flexibility. Also, the temporary employment agency pays all benefits, insurance and additional costs. All costs are included in one hourly fee, which is charged to this plant. The classical problems, which are inherent in a temporary work force, include higher absenteeism and higher turnover. They find, however, this option extremely cost effective. In some years, they have hired 10-15 people from the supplemental pool. According to the Plant Manager, hiring

from the supplemental pool effectively guarantees excellent workers. Without supplementals, they use a 60-90 day initial review period, which doesn't effectively eliminate inadequate employees. After a full year, the employee has been through most work situations.

Orientation/New Hire Training Strategies

According to one manager in Plant B-1, a union facility, they have collaboratively developed an orientation plan that benefits union and management. A new hire spends the first day side by side with an experienced worker. The strategy is to alleviate any first-day major concerns and frustrations. Starting the second day, the same individual is available to the new worker as needed. During this period, the new hires are monitored closely and their ideas are welcomed. However, proper procedures are followed for any work instruction that could affect quality.

Cross training is used extensively in both plants. During a given week, one employee will work many different jobs switching as often as once per hour. Many problems are alleviated, including boredom, muscle and bone soreness, and turnover. They use different motions, and exercise various parts of the body.

The production employees from Plant B-1 felt that initial training was somewhat lacking in quality. All the interviewed new hires were released on their own the first day. This directly differs from the management response, which indicates that someone is assigned for an entire day to each new employee.

Ongoing Training

When asked how training was prioritized, most responded that it would be one of the very last expenses to be eliminated if budgets were cut. The Human Relations Manager said: "Our top management feels that training is a priority." She also stated that individual managers are responsible for training on a decentralized basis and some are more pro-active than others.

Company B is using team building training for management and production to promote cooperation within and between the ranks. Some of their training is conducted by supervisors and production people. The production workers can feel free to bring a training need to light. If appropriate, the training can be conducted by an internal source, or by an outside source.

The ISO 9000 certification required the team building training sessions mentioned earlier for all employees. ISO

9000 has 20 elements, which must be specifically addressed. Element 18 requires that records be kept for identification of training needs and actual training sessions conducted. The ISO coordinator actually spoke to all 1400 employees on each of the 20 elements and made it clear that each employee is expected to help identify areas that require additional training.

The ISO coordinator felt that ISO 9000 is really looking for continuous improvement, and that training is one component that leads to this ultimate goal. He believes that empowerment is a natural outcome of ISO 9000 and can result from this continuous improvement umbrella.

Most of the training is being allocated to production areas and is becoming more and more important each year according to one of the plant managers. He said, "Training has been exciting the last few years because it's very important. At the plant level, we have been told to do what needs to be done in training with few budgetary restrictions. If we want to budget outside training, the funding is not an issue."

The plant manager also suggested that a team of people is being formed to look at different activities and put together a needs analysis as it relates to training. Currently, they have a steering committee consisting of the

project engineers, the union president and the shop steward. This group is responsible for forming the needs analysis team.

At the time of the interview, this company was being acquired by a large multinational company with several plants in North America. According to the plant manager, they are even more pro-training than the current administration. Also, they want less differentiation between salaried and hourly workers.

Miscellaneous Strategies

The plant manager at Plant B-2 alluded to an "employee involvement group" similar to a quality circle. They meet at least three times a week for 20 minutes a day in a small work cell. The facilitator has a guideline and two conditions must be met. First, a topic must be discussed by every group every week. Second, a general interest topic must surface that doesn't necessarily affect work. Coupled with that is a monthly communications meeting where the plant and training managers meet with hourly representatives. Problems and issues can range from simple to extremely complex. These meetings sometimes allow training needs to surface and keep everyone communicating.

OUTCOMES

Benchmarking

The Manager of Human Resources expressed the desire to improve in the area of benchmarking. However, others mentioned general and specific ways where this company compares itself to its competitors.

The ISO coordinator mentioned a consulting group from California that assists in curriculum development. He maintains that the consultants are used as benchmarks due to their relationship with other similar companies. He also mentioned attempts to compare training with a competitor across the street.

The plant manager of Plant B-2 mentioned competing with the Japanese. They lost a substantial piece of business to a Japanese firm only to get it back two and one-half years later. In this situation benchmarking was a matter of survival. By supplying parts to Japanese and joint U.S./Japanese firms, this company has been competing with the best in the world. Consequently, benchmarking has been indirectly involved in every aspect of training, production and distribution.

Finally, the Quality Engineering Supervisor made the following statement: "We continually review and refine our training methods and how we measure the effectiveness of

training." When specifically asked about benchmarking, he added: "One of our goals for next year will be to incorporate some additional, actual measurement tools to look at the effectiveness of training."

Attitudes

The plant manager for Plant B-1 mentioned the team building training that will be given to all employees. He thinks it is one of the most exciting things going as it improves working relationships. All production workers responding to the team building exercise viewed this as a positive step with definite improvements in working relationships.

Attitudes toward the solder training produced some mixed results. Hourly workers at Plant B-1 had some negative feedback regarding the structure and testing for solder training. Their attitudes reflected their desire to have more hands-on training and revised testing procedures to accentuate practical experience.

The Plant B-2 Manager reflected his desire to listen to employees at communications meetings and follow through on their concerns. The change to one hour job rotation, which came through the communication meetings, significantly improved attitudes of hourly workers.

Quantitative Outcomes

One indirect way of measuring quality and productivity is to analyze labor turnover. Low turnover generally means more experienced, better trained workers, producing higher quality parts, if all other factors are held constant. These plants have a 10% turnover for hourly and 4% turnover for salaried workers. In comparison, Plant A had a production employee turnover rate of between 40% and 80% depending on the time frame.

Although neither Plants B-1 or B-2 supplied solid quantitative productivity measures, the production employees and managers both agreed that the increase in training had led to improved quality and productivity. The Plant B-1 Manager made this comment: "You can usually tell how effective our training is by the quality level of products coming off the line. The supervisor looks at the products to evaluate the training. They are able to determine if training has helped."

Plant B-2 plans to develop an evaluation form for training by using a pre-test and post-test. These tests will provide needed feedback for the effectiveness of training, including the measurement of behavior. These kinds of tests are required for ISO certification.

SUMMARY OF COMPANY B FINDINGS

Company B has started some major transformations in the training area. They are in a transitional stage of development in that they are being acquired by another company and they are striving for ISO 9000 standards. The following items are intended to summarize the findings of Company B in regard to their recruitment, orientations and training.

- They do not require a GED or high school diploma, although most production employees have one or the other.
- The process for hiring includes a dexterity coordination test, verification of past employers and two interviews. Basic skills tests are not required and drug testing is only required of truck drivers.
- Orientation lasts about two hours and then they begin departmental on-the-job training.
- New employees work in four hour increments on two work stations until they are mastered.
- Once they are trained, they rotate jobs every hour to relieve boredom and physical problems.
- Initial on-the-job training can take from one week to several weeks.

- Quarterly and annual training updates are offered and consist of various topics.
- In 1995, they began implementing training that complies with ISO 9000.
- The non-union plant uses temporary employees to temper volatile cycles in the automobile business.
- Team building sessions will be taken by all employees to comply with ISO 9000.
- The union plant has a steering committee consisting of project engineers, union president and shop steward that will form a team of people to identify training needs.
- The non-union plant has an employee involvement group where various training needs may surface on a weekly basis.
- Hourly employee turnover is about 10% annually.
- They are developing an evaluation form for training by using a pre-test and post-test. This will include feedback on the effectiveness of training including behavior measurements.

COMPANY C: JAPANESE OWNED**INTRODUCTION**

The third supplier interviewed is a Japanese owned manufacturer of automobile parts. The plant observed is located in a rural area just outside a mid-sized city. As of November 11, 1994, the plant had 360 production, 58 skilled and 84 salaried workers. It is located close to several Japanese transplants, hence, it is geographically located to become a major player in both the Japanese and U.S. supplier network. They produce steel and aluminum finished components for cars and light trucks. The steel plant has been operating for nine years and the aluminum plant is five years old. The average age of production workers is slightly over 32 years and the average length of service is about 3.5 years. The parent corporation operates two plants in the continental United States. However, they produce different products. This wholly-owned Japanese plant has been in the hiring mode recently because 1994 has been a good year for automobile related suppliers.

The aluminum plant was not researched due to time constraints, hence, the steel plant was the entire focus for this third supplier. The employees interviewed included the Personnel Manager, Plant Manager, Engineering Manager, Training Supervisor and several production workers.

PROCESS FOR RECRUITMENT AND TRAINING

Recruitment and Selection Process

In the past, Company C did not have any minimum educational requirements for new hires. According to the Production Manager, they currently demand a high school Diploma or GED Certificate. They have been advertising for production positions in the newspaper, which covers a sizeable metropolitan area. Many of their prospective employees have been obtained from associate recommendations. Once they receive resumes, the supervisors and personnel representatives begin to narrow the search to those with the basic requirements. They check references, require physical examinations and drug screenings. The candidates are brought in for an interview and given an aptitude test with English and math. They also give a special math test to determine where that person might be utilized in the plant. There is a cut-off score that all applicant must obtain; otherwise, they will not be considered. Each interviewer must complete a form rating the interviewee on communication skills, personality, related experience and potential leadership skills. Also a set of specific questions must be asked of each candidate and recorded on this form. They make choices as a group using the ratings as criteria for hiring. Only about 20% of the applicants sending resumes

are called in for an interview. Out of that 20%, only about half of those interviewed and tested are hired. From the time of application to the first day on the job, the average waiting period is about three weeks according to some recently employed production associates.

When being promoted to another job, the position is posted, the person is chosen, then training is required before the associate can begin the new job.

Overall, this process is rather new, and according to the Production Engineering Manager, the newer people are better qualified than in the past. He says, "It screens out a lot of people who really don't belong here." He cites three improvements, including higher basic skill levels, better work ethics and better attitudes. He also gives credit to the new position of Production Supervisor or Training Supervisor for a better screening, testing and interview process.

Orientation and Training Process

The current orientation and training process began by requesting that each department manager give feedback regarding employee skill requirements. As spontaneous training was offered, an organized training program evolved. The one week orientation evolved from this idea, and it is under constant scrutiny and change. The Production Manager

put the first one week training course together with the help of managers and supervisors. The Production Trainer has been working with the various groups on modifications. Presently, they train new associates in three separate entry level areas.

During the first week, several different departments are involved in training. These include personnel, safety, maintenance, quality, manufacturing and production engineering. Various topics include right-to-know laws, lockout/tagout, total productive maintenance, hearing conservation, lubrication, measurement, reporting, crane operation and total productive performance.

The total training time for Department A, of the three entry level areas, is 83-90 hours. This includes 56 hours of on-the-job training and the remaining 27-34 hours of classroom time. This training is in addition to the first week of orientation. Some topics include purpose, history, process, safety, manual operation and automatic operation. It lasts about two weeks.

This 83-90 hours of training for Department A is primarily conducted by the Production Trainer. He is supplemented by the line leaders (hourly paid with more responsibility than a regular associate) who come in and talk about a specific area. When they are on the floor

during weeks two and three, the line leaders will watch new associates to ensure that they are performing duties correctly. After the third week, they are expected to function in that department. Line leaders and regular associates all assist the new associate and act as trainers.

The new associate is expected to gradually increase production during the initial several months and finish training within six to twelve months. New associates are scattered to all three shifts so they don't adversely affect one shift. During this six months, they will remain on whichever shift they were originally assigned. After the long term training, they are assigned to a permanent shift, usually second or third.

The skilled trades area consists of die-set and maintenance. They go through the first week of orientation but have their own program for development after the initial week. They tend to use more outside sources for training. Examples include basic mathematics, algebra, geometry, trigonometry, blueprint reading and shop skills. When this training is offered, all employees attend, even those with higher skill levels.

STRATEGIES FOR HIRING, ORIENTATION AND TRAINING**New Hire Strategies**

Company C hires about 10% or less of the applicants who submit resumes. Even though the area's unemployment rate is extremely low, this plant uses extreme caution in resume perusal, interviewing and hiring. According to the Personnel Manager, "This plant requires a lot more skills than some of the other plants so we have to be more particular." The Assistant Personnel Manager stated that basic mathematics, technical and welding skills are required to get the caliber of person they need for long term employment. Also, because most production associates are required to do their own maintenance, aptitude test results are needed to find the top candidates in the area. They initially require resumes rather than applications because they think it is a better screening tool. They ask for an application when they are hired.

Orientation/New Hire Training Strategies

As stated earlier, the orientation and ongoing training programs have evolved into a higher structured and organized activity. There is a detailed outline where each department gets involved in training. This enables newer employees to keep up with their new duties and rely less on the more seasoned employees.

The constantly changing program has been a product of both management and production. One trainee commented about the lack of plant involvement as compared to classroom lecture. She commented: "For the first week and a half, I never stepped foot in the plant. When they try to explain something and you don't see it, it's hard to visualize." Her comments didn't go unnoticed. The next time she went in for training, they had taken her advice and rotated lecture with a plant visit.

From top management to production associate, each person expressed the strategic importance of orientation and training. The Assistant Personnel Manager had some compelling reasons for training. She said that without training, accidents will go up, workman's compensation rates will rise, defects will increase and more repairs will be needed on the machinery. The Training Supervisor cited productivity and lack of skilled manpower as reasons for their training emphasis. The only way to improve in these areas, according to the Training Supervisor, was to do more and better training. Two of the production associates expressed their realization that training had helped their productivity, confidence and appreciation for a common goal.

The strategy of cross-training employees is employed by Company C, especially within a specific department. During

the first three to four weeks, new employees are trained in all aspects of their departments. One production associate of three months was already cross training a new associate in his department.

During the first three to four weeks, a new associate will have several mentors. The mentor is usually the line leader in charge of that particular area. The primary reason for mentoring is to avoid an injury and to ensure a high quality product. However, the line leader is not the only one watching. The production associates are instructed that if someone is doing something improperly, tell them. They are taught to watch themselves and everyone around them. A large portion of orientation and new associate training is dedicated to safety. The new associates must respect the machinery due to the chance of a serious accident.

Ongoing Training Strategies

In the long run, the expectation is that all employees will get a base amount of training, followed by advanced training. This whole process takes about three years, according to the Production Manager. Once the expertise begins to surface, then cross-training would be the next logical step. The Production Manager would like to create a surplus training pool made up of people who are very good at

their current jobs. These people are trained in a specified area, such as mechanical, and when a position becomes available, these trainees become the candidate pool. All of these candidates will spend several months learning in the given department. The Production Trainer conceptualizes this long term training in a similar way. At the present time, he says they are offering very basic training, which he refers to as phase one. This basic training is mostly for new or newer employees. After that, he envisions phase two and three, which he calls intermediate and advanced training. He expects those two phases to be 40 hours each. For a new employee, the basic required formal training would consist of 120 hours in year one, and forty hours in years two and three. This would only include classroom training. On-the-job training would be in addition to this and could last six to twelve months. He hopes to start phase two and three within two years.

The Production Engineering Manager made some references to *review training*, which is the same as ongoing training. He speaks of *review training* as additional training, which is offered on an as-needed basis. They may desire to upgrade skills and review their abilities, which is more proactive. Also, they could be experiencing a problem such as production or quality, which is more reactive. Finally,

he suggested that training may be in response to a new process which would require classroom and on-the-job training.

The Production Trainer and Production Engineering Manager both made some comments regarding training in Japan versus training at Company C. They were both referring to training at their parent company plants in Japan. The Engineering Manager referred to training in Japan as long-term improvements or solutions where each of seven training steps is built upon a previous step. Each step is taken religiously. He says that at Company C, "We have focused on the areas that need the most attention. They're not built on each other like that." He believes that they are doing the same training with a different perspective. He says the major difference is in timing, focus and attention. Also, in Japan the training would be completed before the associate starts any production. They use more visual aids; we use more on-the-job training. When they compare productivity in Japan to Company C, he says they exceed us in several areas. They have learned how to keep the equipment running and how to keep it productive.

OUTCOMES**Benchmarking**

Benchmarking has taken on four dimensions for Company C. First, they do some comparisons to non-competitors in their industrial park, according to the Production Engineer. They haven't used anything yet, but it can provide a source. Interestingly, none is a Japanese plant and none is even in the same industry.

Second, they compare themselves with their counterparts in Japan. The Production Engineer says that the company in Japan's ability to produce productive and quality products exceeds Company C. He believes that it can be traced to the skill level of the entry level person and the turnover rate, which is much lower in Japan.

Third, both managers and production associates compared their training with former employer's training. To summarize their comments, few had formal training programs and only one had a week long orientation program for new employees.

Fourth, the Personnel Manager mentioned that they have not benchmarked their training because it is too new. In fact, he said they are establishing the benchmarks at this point. The vast majority of training ideas come from within their plant.

Attitudes

The initial training program, the bonus system, the accent on team building and the emphasis on safety have all had an impact on attitude among production associates and all levels of management. The managers mentioned several areas where they have witnessed positive attitudes. A few of those areas are increased confidence, union avoidance, enhanced working relationships and the general feeling of being part of a team.

The production associates voiced some frustrations but overall their attitudes were very positive. One associate said, "I guess they just kind of train everybody to have one thing in common, which is working here, and build on that first. It's like they treat everybody equal."

The bonus system is another attitude improver because everyone gets a bonus. The bonus increases after you have worked six months. One associate spoke of being more comfortable, confident and knowledgeable. He also mentioned the president and his appearance on every shift, every day. The associate had a lot of respect for the president stating, "Basically, if you're here working, he's going to be here because I guess he feels like he should be here to keep up morale." Their attitudes are reflected in a one word expression or phrase when asked to summarize the

company. The responses were, "Great," "Outstanding," and "Dedicated."

Quantitative Outcomes

The quantitative outcomes that were discussed included lost time accident rates, turnover, productivity and quality. On December 12, 1994, they had just celebrated 1,000 days without a lost-time accident. Many associates mentioned the push for safety in the plant. The employee turnover rate is about 20% because unemployment is so low in the area. In Japan the turnover rate is below 5%, but that is typical due to company loyalty. No actual quantitative measures were obtained for productivity, but every manager and associate has confidence that productivity will improve as a direct result of the training program. The trainer said, "I'm looking for an improvement in productivity, quality and safety in the plant, and I hope for that to be measurable." Productivity at Company C is measured by what they call total productive performance, which is the up-time of the machinery multiplied by the number of units produced during that up-time.

They measure quality in three ways: the percentage of scrap, an internal quality trouble incident report and the number of customer rejects. The Production Trainer made two comments about these various factors. He said that even

with the huge number of new associates hired, the indices haven't been adversely affected. Also, he expects to see some improvements when the existing employees get into some advanced training.

Miscellaneous Outcomes

To effectively sense the guiding principles of Company C, the following statement was taken from a plaque in their waiting area: It was entitled "Company Principle" and it read, "Company C will supply products to customers with the finest satisfaction, backed up by the concept of coexistence and co-prosperity with customers and society." Just below that was another statement of Management policy. It read:

- A. We promote safe, clean and attractive working conditions with efficient productivity.
- B. We encourage the constructive interchange of opinions and ideas within the framework of our company goals.
- C. We adapt to the changing needs of the market and society by retaining a youthful, flexible point of view.

SUMMARY OF COMPANY C FINDINGS

Company C has recently hired a production trainer with the intent of expanding training within all areas of production. The following are statements that summarize the recruitment, orientation and training of Company C. They represent processes, strategies and outcomes.

- A GED or high school diploma is required. A resume is required in place of an application.
- Reference checks, physical examinations and drug screening must be completed.
- An aptitude test including English and Math must be taken and a thorough interview process is required including rating forms.
- Production employees will begin employment with a one week orientation consisting of classroom activities mixed with plant observation.
- Orientation topics include right-to-know laws, lockout/tagout, total productive maintenance, hearing safety, lubrication, measurement, reporting, crane operation and total productive performance.
- In addition to the orientation, approximately 90 hours of additional training is required including 2/3 on-the-job and 1/3 classroom training.
- The orientation program is constantly being changed by joint input from production employees and management. Suggestions from new production workers are often implemented immediately.
- The total training time is six to twelve months where a production associate will be considered permanent and could then serve as a trainer for other new associates.

- Skilled trades associates take unique training after orientation including basic mathematics, algebra, geometry, trigonometry, blueprint reading and shop skills.
- Company C places a high value on safety issues.
- A bonus system is in place which is paid to all employees including new hires.
- Within two years, they expect to add phase two and three to their training program, which includes forty hours of classroom training for each phase.

COMPANY D: JAPANESE OWNED

INTRODUCTION

The fourth automotive parts supplier interviewed is jointly owned by two large companies. The plant researched is nestled in a quiet country community with no large cities nearby. It is geographically located in the Mid-South. In the fourth quarter of 1994, this location employed 688 people, 456 production, 38 skilled trades and 194 salaried. They are a non-union facility that produces plastic parts for interior, exterior and under-hood applications. They started manufacturing parts in 1987 with a major expansion in 1990. For the last few months in 1994, they were in a hiring mode. The parent company with 80% ownership has no

other manufacturing facilities in the U.S. They do have a sister manufacturing plant in Canada.

The researched plant has 216,000 square feet of manufacturing floor space and 30,000 square feet of warehouse space. The total capital investment in this site is approximately \$30,000,000. The number of employees has grown from about 150 in 1988 to 688 in November of 1994. Their sales dollars have grown from about \$10,000,000 in 1988 to about \$150,000,000 in 1994. They have adopted the following statement regarding employee involvement: To improve the quality of work life, an environment that encourages continual learning and development. Their statement on community involvement is as follows: Take an active part in local activities so that Company D and its employees are recognized as a "Trusted Member of the local community." In regard to training the following philosophy applies: (1) Continually improve employee job knowledge and skills based on the concept that employees are our company's most important asset. (2) Training courses will be set up according to each department's needs including orientation and core training. Company D has received the Chrysler quality excellence award, the New United Motor Manufacturing Incorporated (NUMMI) partnership award and the Ford Q-1 award.

Company D is separated into divisions, departments and sections. Its divisions are General, Technical and Production. It has 12 departments and 33 sections. It also has a separate legal area and senior coordinators for each division.

As an introduction to the processes, strategies and outcomes for Company D, it is useful to mention their vision of excellence. The triangular shape is so designed to place customer satisfaction at the peak where everything leads to that goal. Training is integrated into everything in the base and middle portion of the triangle.

PROCESS FOR RECRUITMENT AND TRAINING

Recruitment and Selection Process

The Japanese have a different view of hiring new production technicians. According to the Assistant General Manager of Human Resources, the Japanese like to hire people with no experience. He partly agrees because the person will not have acquired bad habits from past employers.

All people hired for hourly production positions are referred to Company D from the local job service. They have an ongoing relationship with job service, hence, referrals reflect basic requirements of which they are very familiar. If an individual offers an application at the plant, they

are referred to the job service. The referrals include information such as background, education, training and experience. Once the applications are screened, potential employees are invited for an interview. One basic requirement is that a person has the manufacturing mind set including working overtime, shift work, weekend work and other manufacturing characteristics. The shifts at Company D are based on a rotating, two-shift operation. The shifts are 8:00 a.m. to 4:30 p.m. and 8:00 p.m. to 4:30 a.m. with weekly rotations. This leaves three and one-half hours for the maintenance people to maintain and repair machines, ensuring eight hours of trouble-free production. If a person is not selected for a current position, the interview process is designed to pre-select a person for a future position when it becomes available.

During the interview, a few characteristics are carefully examined. One characteristic desired is the willingness to become a team player. Most of the production workers are part of a team in the plant. Production readiness competitions are part of the company culture. It is a Japanese concept that rewards teams with copper, silver, gold and diamond awards. They are looking for someone who shows a willingness to accept training to do whatever is necessary to get the job done.

Typically, they may either hire one person for a replacement or several people for a new product startup. After the positions are posted in the plant, outside candidates are interviewed for any positions that are vacated. Usually, about 30-40% of the people interviewed are hired.

The candidates must have either a high school Diploma or GED. They fill out an application and it becomes obvious who can spell or write. There are no basic skills tests required. Because of the legal technicalities, reference checks are almost nonexistent. The Assistant General Manager of Human Resources stated that he will not talk with anybody about a person's job performance at Company D with or without a release from the employee. However, what occurs off the record can be much more useful.

Orientation and Training Process

The orientation process has been revised to include a three- day program as opposed to the past one-day orientation. Even the expanded three-day program will probably grow and develop over the years according to the Manager of Training and Development. The new program begins in 1995 and will include a discussion of company philosophy, some video tapes on Company D, health and safety issues and

human resources information. The last half of the third day will be spent with the new employee's supervisor. The supervisor will have a check list to cover with the new employee. In addition to this three-day orientation, the new employee will be expected to attend some general orientation courses during their first year. The orientation will be offered every two weeks. The Manager of Training and Development is thinking of putting this information on CD-ROM when one or two people are hired. However, when enough people are ready, a formal orientation could be offered to those who have not been through the program. The Assistant Manager of Human Resources feels that it is intimidating to place a new manufacturing production technician on a \$300,000 - \$400,000 machine immediately. He favors the idea of observation instead of production for one-half day. The full responsibility for production parts, he feels, should be a slower process. One of the trainees, however, suggested that a one-day orientation was sufficient and additional days would result in boredom. This adds incentives to use the extra two days wisely and to make it simultaneously educational and interesting.

The process for identifying training needs is accomplished by the Diagnostic Analysis for Curriculum

Development technique. The training department is primarily responsible for identifying training needs. In 1993 they went to each department and did a competency study, the knowledge and skill required for each job. A further description of this will be included in training strategies.

The process for training, both new and ongoing programs, is coordinated by the training department. Each month, the training department gives the production manager a list of all the employees, courses offered and courses taken and/or needed for each employee. The employees will sign his/her name by the class or classes that they wish to take. The lists are turned into the training department, scheduled and then confirmed with each attendee. The classes are typically scheduled between two weeks and two months in advance. Some classes are offered regularly, like communications or writing kaizens. "Kaizen" is a Japanese word for continuous improvement. Other classes offered include a series of six SS courses (SS is sorting, straightening, sweeping, sustaining and self control), total productive maintenance, safety orientation, statistical process control and many others.

The process for requesting training resources starts with the department's needing funding. The manager of training is notified by a development head that a certain

amount is needed for training. The requests are submitted to general affairs where the actual dollars are allocated to the training budget.

STRATEGIES FOR HIRING, ORIENTATION AND TRAINING

New Hire Strategies

Production technicians at Company D start at \$6.50 per hour. According to the Assistant General Manager of Human Resources, there are many people who will not work in the area because the various welfare programs pay as much as they do. By the time they pay for child care and drive to work, they really don't have enough incentive to break away from social services. Consequently, Company D is having trouble finding people with the qualities needed to be successful. Company D does not give a basic skills test for new hires. Consequently, one supervisor expressed concern about screening. Based on previous comments regarding reference checks, it is obviously much more difficult to get a reliable reference. However, production technicians are unaware of this. They have the impression that all references are checked. This strategy for hiring new employees seems to work as long as they believe their backgrounds are being investigated.

1990-1991

1991-1992

1992-1993

Orientation/New Hire Training Strategies

According to one of the production managers, each new employee takes about five courses in the first year including some 20 minute SS short courses and some two hour courses. It is up to each new employee to schedule the required courses. On the first day of orientation, Company D doesn't try to overload the employee with information. Instead, they spread the courses out. The technicians seemed to prefer plant experience as a prerequisite for many of these classes including Company D production system (TPS) and total productive maintenance (TPM). One technician commented: "Especially with TPS, I had no idea what they were talking about because I hadn't been out there to see how things work." The amount of training given to new employees is a little over a week in the first year, according to a newly hired technician.

When a new person is hired, one of the better technicians is chosen to work along side the new employee. Full production is not expected of the new employee until at least six weeks. In some departments, the technician originally assigned to the new employee is asked to assist that person during their initial training period. However, in other departments, according to some recently hired technicians, they will start you with one person and move

you to another mentor in one or two days. The intent is to learn from a broad group of technicians rather than just one.

Ongoing Training Strategies

One training strategy used by Company D is to send a production supervisor or specialist to Japan to learn the techniques around SS, TPM (total productive maintenance) and TPS (Company D production system). The supervisor would spend time with their counterpart in Japan watching, learning and taking notes. Those same methods would then be used back in Plant D. Also, specialists from Japan come to Plant D to train workers. They typically teach TPS or operating production equipment.

Course development follows a standard goals, objectives, and desired outcomes model. They start with a course design document where business rationale and course objectives are analyzed. Next, the desired outcomes are set based on the objectives, and materials are gathered in order to meet those objectives. The objectives are a natural byproduct of the survey that each employee fills out each year. They write down areas where improvement is needed. When it is obvious that a certain training need is required, the course is developed. For example, one of the assistant managers has developed a training program for operating a

certain type of machinery. It is a 30-minute class that is offered monthly. This is a recent development in response to requests from technicians to be trained on specific machines.

Once a training need is determined by the training department, then everyone in that department is required to attend, including managers and supervisors. The course will appear on all employees' training records as an uncompleted course. The employee may take the course at their convenience, but they know they need the course and that it is mandatory.

The training department normally offers classes once the shift is over from 4:30 p.m. to 6:30 p.m. The technician leaves the work area, enters the classroom and then clocks out after class. Each year, technicians will be required to attend approximately 10-30 hours of course work. If a topic is being emphasized, such as TPM, the number of hours will be on the upper end.

Company D uses cross training in some departments, but it is not company-wide. With increases in production, cross-training has slowed considerably. The Assistant General Manager of Human Relations would like to see a rotational program where a person would spend six months to a year in each department and then shift departments for the

same length of time. Presently, they are rotating production supervisors through production inventory control and production planning. This helps them understand where orders come from and how raw materials are gathered and staged. The Japanese are believers in cross-training but make a major distinction between technical and non-technical positions.

One final strategy is to provide free training to suppliers or customers who want to implement similar systems. According to the TPM supervisor, the Japanese like to promote themselves to customers and help suppliers produce higher quality products at a lower cost.

OUTCOMES

Benchmarking

The equipment in Company D is the newest and most efficient available. Most of it comes from Italy or Japan. Company D sends trainers to Japan to learn their system, and affiliate plants in Japan send specialists to the U.S. to train technicians in subjects such as production systems and equipment operation. The courses, in many cases, are the same in Japan as in the U.S. because they are taught by the same person. As Company D became more self-sufficient, the local trainers have mimicked the methods of those Japanese

trainers. Consequently, Company D and its counterpart in Japan are constantly setting mutual benchmarks.

A major partner for Company D is Toyota Motors in Kentucky. Their people visit Toyota Motors Manufacturing (TMM) to look at the total productive maintenance (TPM) program and their quality circles. Representatives from TMM also visit Company D on a regular basis because they are impressed with their facility. Staff from Company D did some presentations to TMM because they are implementing a similar segment of TPM.

A third benchmark plant is a sister facility in Canada. About three years ago in 1991, Company D didn't have a TPM program in place so they sent people to Canada to study their system. The basic conclusion is that Company D is now setting new benchmarks especially in the area of productive maintenance and their course selections.

Attitudes

According to a TPM supervisor, productivity, defects, delivery and safety will affect morale. When the technician can fix his/her own problems, such as maintenance of a machine, they have a better feeling about their job. The supervisor uses a morale measuring device that looks like a radar chart. A perfect circle at five indicates no

improvement areas can be detected. The larger the circle in diameter, the more improvement, hence, higher morale. A perfect five in every category indicates no more training is needed, but this is highly unlikely because it is a dynamic process.

According to a recent trainee, the supervisor's statements can be verified. The trainee says, "Company D trains you more. They emphasize quality more. They want you to make sure you know your job. They keep checking, especially when you're new. If you are having trouble, they follow up before you run bad parts." Another longer term technician stated, "I feel more valued here than I did at my last place."

Company D offers many classes that are intended to improve attitudes such as a teamwork class, communications and SS series. In fact, everything offered requires working together as a team such as TPM and TPS. One technician suggested that when one person is struggling while others are caught up, the latter technicians will help the one who is behind. Consequently, it is viewed as a common problem. Without exception, all technicians mentioned the teamwork ideology and had a very healthy attitude toward management for promoting high levels of morale.

Based on the comments of the TPM supervisor, most technicians are positive towards training that can be applied to their jobs, but rather negative towards training that produces non-tangible results. A few technicians commented on the personal benefits of training. A few of those include stressing quality in all things, labelling at home, putting things where they belong, organizational skills and cleanliness.

Although most supervisors seem to encourage training, one technician cited an example where training was not emphasized. Another expressed an improvement in morale when a manager was replaced. The new manager is seen working with technicians taking care of problems. Still another technician praised his supervisor for encouraging teamwork, which eventually became a habit for him.

The general attitudes toward taking classes and toward their content vary. One technician differentiated between the mandatory classes and voluntary ones. He claims that attitudes are much poorer with the mandatory classes. However, when viewed as a whole, technicians seem to really appreciate the whole idea of offering courses at that level.

A technician commented on the repetitiveness of course content. She said, "It makes you feel comfortable with your job, I guess. There is quite a lot of repetitiveness and

some of the stuff is not directly related to you." Another technician stressed the long term benefits of a kaizen system course. When he took the first kaizen course, he had nothing to apply. However, his current job requires kaizen knowledge. He can finally see the benefits.

Quantitative Outcomes

The training manager has used the Kirkpatrick Model on four levels to evaluate training. One area of this model in which they have been successful is providing pre-surveys and post-surveys of participant responses. They are finding it difficult to extract some information. They believe the information is all there, but finding the time to pull the information seems to be the problem. A few of the outcomes have been quantified and have shown excellent results. For example, in Tig welding and electricity training, a 69% increase in knowledge was shown.

They follow a stringent design development process for all training courses. It starts with desired outcomes, the purpose of the course, the specific objectives to be achieved, the length of the course, the audience and evaluation methodology. With a course designed this way it's fairly easy to build in evaluation techniques. The training manager has been moving in the direction of quantifying training outcomes but has been met with the

typical "We can't measure it" response. She is saying, "Yes, we can. You just have to find the right measures."

The following examples are some areas where Company D has been able to quantify some outcomes. Their turnover rate is less than 2% annualized. By any standards, that is a very low rate. Their goal is less than 2% for both turnover and absenteeism, however, absenteeism is not part of this study from which conclusions have been drawn. The TPM supervisor has seen the knowledge level go from 25% to over 90% when using a pre- and post-test in TPM training. In the same department, the supervisor conducted an activity showing reasons why machines were not running. Using a charting technique, the most prevalent problems become obvious. A target was set to improve production time. The goal is to concentrate on the biggest problems, namely cleaning time. Each problem was measured before and after the activity to show relative changes. Overall down time after the activity was reduced from 64 minutes to 28 minutes per shift.

Finally, when the technicians were asked about improvements in quality, defects or productivity, the responses were all positive. All technicians interviewed felt that training most certainly will lead to positive results for all of the above measures.

SUMMARY OF COMPANY D FINDINGS

Company D offers a full menu of training courses to production employees that may be taken at their convenience. Their vision of excellence, a triangular shaped model, integrates training into all aspects of company goals. The following statements summarize the processes, strategies and outcomes of recruitment, orientation and training.

- All applicants for production jobs must be referred by the local job service.
- Once they are referred, they are invited for an interview where a person is asked about overtime, shift work, weekend work and other manufacturing characteristics.
- All applicants must have a high school or GED and no basic skills test is required.
- A three day orientation is required prior to releasing an employee to run production parts.
- Each new employee will take about five courses in the first year after orientation, including productive maintenance and production systems.
- Each month, a list of course offerings, and courses needed by each employee, are submitted to the Production Manager.

- Production supervisors or specialists are sent to Japan to learn SS series, TPM and TPS. Also, specialists from Japan come to the U.S. to train workers.
- Courses are usually offered during the downtime period from 4:30 p.m. to 6:30 p.m. and production employees are paid for their time spent in the classroom.
- Cross training is offered in some departments but slows considerably during peak production periods.
- Free training is offered to suppliers and customers who want to implement similar systems.
- Toyota Motors and Company D have established a partnership for sharing training ideas.
- The Kirkpatrick Model has been used successfully to evaluate training outcomes.
- Tig welding and electricity training have shown a 69% increase in knowledge.
- The turnover rate is less than 2% annualized.
- In TPM training, the knowledge level has gone from 25% to 90%.

COMPANY E: AMERICAN OWNED**INTRODUCTION**

Company E is a 49 year old, non-union, parts supplier to the domestic automobile industry. They are located in the Midwest and produce interior trim components as well as exterior lighting. They employ 1,000 production and skilled trades workers along with 200 salaried employees. They have been in the hiring mode since the first quarter of 1994. The average age of their production work force is approximately 30. Company E's parent company operates seven plants in the U.S.

PROCESS FOR RECRUITMENT AND TRAINING**Recruitment and Selection Process**

Company E used to hire people off the street, looking for individuals with experience. Today, they use an agency due to legal pressures. The agencies screen the prospective employee, looking especially for attendance problems. They also give the candidate a drug test. Company E gets the employee for a 90 day probationary period. There are no obligations to hire this person on a full time basis. The candidate is an employee of the temporary agency until Company E decides against employment, or offers full time continuing employment to the candidate.

When being considered for full time employment, the employee must be willing to obtain the GED. The current employment policy or philosophy emphasizes the attitude and ability of the candidate to be trained, rather than experience.

Orientation and Training Process

A new person starting at Company E, receives a general orientation, including benefits information, work expectations, scheduling and a drug screening. Some employees need to have a Statistical Process Control (SPC) course before beginning production, especially inspection employees. New employees also get a first-aid and safety class. Once they have been through the generic one or two days of training, they will begin training in their individual department. An individual is placed in the molding department, will begin basic molding classes either on the floor, in a classroom, or both. This would take about 30 days. During that 30 days, the new employee will be running production. If they do not have a GED, they will also be given the opportunity to take those classes during the same 30 days. They come after regular working hours for the GED classes, a service provided by the company without charge. Classes like SPC and molding operation training are offered during regular working hours and the employee is

paid during this time. If those classes are in addition to their regular day, they would be paid overtime.

Blueprint training classes are offered to all employees and have been very popular. For some specific areas like maintenance, a tape series is used to train in preventative maintenance. The specific training is about 75% on the floor and 25% in the classroom.

Training in the classroom could be completed within 90 days. For the remainder of the first year, training is primarily on the job. Most new employees would be considered fully trained, in the initial phase, after one year. Classes after the 90 day period would be a continuation of the beginning course, and primarily advanced in nature. The training is often given by a relief training operator who is a senior hourly paid production worker. The Supervisor often will spend some time training the new operator as well. According to the Plant Manager, "It's really more of a hands-on situation or a buddy system, where we'll put the senior person with a new person. They go through the motions and techniques for the job and they come back to monitor their work regularly."

The classes that are taken during the first year and thereafter are opened up to line operators. When a course is full, according to seniority, the remainder are allowed

to take the course when it is offered again. In the molding department, a new person would get approximately 30 hours of classroom training in addition to eight hours of action (quality) circle training. The action circle training is voluntary. An action circle group will work collectively as a team on various projects. For example, an action circle group recently designed a 30 page booklet explaining all the tasks that need to be performed in one department. This booklet will be distributed to each new operator in this department.

STRATEGIES FOR HIRING, ORIENTATION AND TRAINING

New Hire Strategies

The strategic importance of using temporary employees is that they are employed by the temporary agency and there is no obligation to keep them. When a slowdown occurs, the temporary employees could be gone within two weeks without any further pay or benefits. Unemployment insurance is paid by the agency. They are able to really evaluate people over the long run and make good solid choices for permanent employees.

The Director of Quality feels that by using this system, a more proficient group of employees is being hired. However, the Plant Manager feels that temporary

employees are here to meet their own temporary employment needs, not the needs of the company. He says, "I would rather have full-time employees and no temporaries, or hold temporary employees down to a minimum. However, he adds, "We put them on probation for a total of 180 days, if they meet our criteria during that period, they are entitled to all the benefits we offer our employees."

Orientation/New Hire Training Strategies

Company E employs a Manager of Training who is responsible for curriculum development and delivery of training. He does a lot of stand-up training, which is very time consuming. He covers six plants so he is constantly searching for efficient ways to train. He is working on a project to provide computer-based training for new employee orientation, fork-lift training, and Occupational, Safety and Health Administration (OSHA) refresher courses. He would like to obtain 5-10 computers and the applicable software. Also, the pre-tests and post-tests would be taken on the computer. This computer training would also be used by the temporary employees, so that when one or two people are hired, a stand-up training course would not be needed. The savings could be substantial since hiring could be more production driven and fine-tuned.

In Company E, job titles progress beginning with line operator, group leader, group supervisor, supervisor, plant superintendent and plant manager. The line operators, group leaders, group supervisors and supervisors are all hourly employees. All these people serve as trainers, especially within on-the-job training. The Training Manager conducts a class in which he trains the trainers who are called relief operator trainers. The trainers are assisted by a booklet which is given to new employees and a display card for every operation. These display cards hang near every machine or operation and include both a graphic display plus a clear description of that particular job.

As new employees are trained, they are given 30, 60 and 90 day ratings, which include dependability, expandability, quantity of work, quality of work, job knowledge, initiative and ability to learn. During the first three to six months, a trainee is given a minimum of one hour of on-the-job training a day, which works out to between 60 and 120 hours. A trainer will spend a considerable amount of time with the new operator for three to five days, but then it begins to taper off.

Ongoing Training

The primary question of ongoing training is how are needs identified? In Company E , the Manager of Training

makes many of those determinations with the help of the managers and supervisors. The managers supplement the Training Manager with ideas and requirements.

Training needs show up in a problem-solving team or actions circle. If the solution to a problem is more training, then they will value that recommendation. The action circle has an eight week, one hour a week, training session. There are about 12 circles with six to eight people in each one. According to the Plant Manager, another way that the training needs are revealed is when a production manager or superintendent requests that training be given to someone who is lacking in a particular area.

The training manager trains the trainers, who then teach the operators. The idea is that those most familiar with the operation are better able to convey training materials. When the Training Manager trains the trainers, he has them present a mock situation in the classroom and then critiques their performance and suggests improvements. The training manager goes to all six plants in the area teaching these training modules. A local community college teacher also gets involved in training at Company E. He teaches blueprint reading to anyone with the desire to learn. Finally, some of the technicians from supplies come in for periodic specialized training.

Training in Company E is strategically important for many reasons. Some strategies for training include:

- (1) Training for new technologies.
- (2) New equipment brought in for an operation.
- (3) Quality problems or non-conforming parts.
- (4) Motivational training for new ideas.
- (5) Self-improvement training.
- (6) Training designed to stay ahead of the competition.
- (7) Improve basic skills and knowledge.

Some of the training is critical in the short-run such as quality alerts, while some is longer-term training, such as self-improvement or motivational training. When a quality alert review is held to improve part conformity, the parts can be tracked back to the operators since they are date coded. If one operator is at fault, then training may be given only to that individual. The Director of Quality implied that much of their training is proactive, not simply in response to an urgent problem. He implied that a long term approach must be taken in training, citing competition and basic skills as two important areas. He says, " If you're going to compete in this world in the 1990's and beyond, you better have trained employees. It's a little frightening how many people we are training because they have not acquired their high school education". The Plant

Manager suggested that most training is intended to improve the employee. He says, "We ask our people to get all the training they can so they can improve themselves."

According to the Training Manager, classroom learning is about 50% video tapes, 30% lecture and 20% group exercises. Each class typically has between 10 and 20 employees. The Director of Quality says the classes are taught differently depending on the subject. They use a seminar-type format for the blueprint class. He says brainstorming is used as a teaching method, but they usually use a seminar style, group activities or whole classroom discussion. The management went off-site for five days to receive the just-in-time inventory training. Upon returning, they went through the training with the superintendents and supervisors. Finally, the training was gradually transferred to the production employees.

OUTCOMES

Benchmarking

Company E uses state of the art equipment that aligns parts called a vision machine. The training on that particular machine is also state of the art. They seem to be the trend setters in this area. In other words, their benchmarks are their own imagination. One Plant Manager

sums it up like this, "We get a new robot or new piece of equipment that is really leading the industry, I will make sure our people get properly trained."

The training intended to reduce scrap is benchmarked against customer standards. The plant manager said, "If we quote a job at 6% scrap, we'll benchmark at 3% scrap and shoot for that, making sure that our employees are trained to meet the lower goal."

The Director of Quality summarized benchmarking when he talked about the business being customer driver:

"Chrysler comes in for a process review several months before actual production begins. If the work force is not properly trained, the Chrysler representatives will simply leave and wait until you get it right. The bottom line is that benchmarking in this business might be in vain if the customer isn't pleased. In fact, the benchmarks are set by the customer and the customer training programs might provide the best benchmarks of all."

Attitudes

The Director of Quality attributes their lower reject rates to employees with the right attitude. When they hire someone for production, they are looking for attitude and ability to be trained, not job experience. The Training Manager speaks of culture and "how we work around here". These are attitudes. He says they called this training "just in time" but it was really total quality management. He says, "I don't call it anything, but it's really total

quality management. It's just part of how we work, which is how it should be and it's become part of our culture."

The attitudes of the hourly employees are inspiring. They all responded positively when asked about the company's support for training. The only unenthusiastic comment was, "Sometimes, they talk about training more than they actually get people involved." However, that response was in the minority. Every worker polled, when comparing Company E's training program with past employers, commented on their superior training emphasis.

Quantitative Outcomes

The Director of Quality has no doubt that adequate, effective training leads to higher quality and production. He believes that it is a direct correlation and gives an example. He has 30 employees on one production line, and 10 on another line. They have produced zero rejects in the prior five months to the date of the interview. His reason for such phenomenal results is "Extensive, almost aggressive to a fault, training went into that line." He gives another example regarding two brand new parts, which were not being run ten months prior to the interviews. He says:

"Ten months ago we didn't make a single unit of part x or part y, now we're making 50-60 an hour, four different colors and utilizing just in time sequential delivery, and

we're not getting any rejects. Something had to work. If we didn't put the effort into training, equipment and technology, it wouldn't happen. It's a one to one correlation, good training, good parts; bad training, bad parts." He also says that his reject rates are far better than in the past few years and he attributes that to an employee with the right attitude, well-trained and familiar with the process. He also points to the poka-yoke system for making parts. The poka-yoke system, which is a Japanese word, means infallible. In a production process, it simply means that the part can only be run one way. The only dilemma is when the customer, due to design, limits the ability to give the part a true fail-safe system. The Plant Manager links training to performance by stating, "We know our performance is better than average and obviously the training allows us to perform better than we had in the past."

The Training Manager gives a pre-test and post-test in injection molding training. He says there was about a 90% increase in knowledge based on the testing. Another Plant Manager states, "Theoretically, we know any applicable education you provide a person with will help them in performing their job." When hourly employees take an SPC or just-in-time training course, they are tested at the end

of each session. The educator grades the test and reports a pass or fail grade.

One of the hourly employees verified that any training received by employees is followed up to make sure it is being done correctly. Another hourly worker felt that training does improve quality and productivity. A third worker qualified that by adding "job related training", assuming that non-job related training adds little to quality and productivity.

Another group of hourly workers with more seniority came to similar conclusions. According to one five year employee, quality has improved because they are able to isolate more parts with defects as training increases. A twelve year employee agreed that productivity had increased due to training.

Company E has experienced a relatively low labor turnover rate. Without temporary employees, the rate has been between 5 and 10 percent.

SUMMARY OF COMPANY E FINDINGS

Company E has one Training Manager who visits six different plants. His time is limited, considering that he administers the retirement plan and other special projects.

He will have more available time when the training function is computerized.

The initial orientation period is limited and the new worker is almost immediately put onto the production floor. This is primarily due to the use of temporary employees. Their results are very good, therefore, the current method must have some advantages. Company E is the only one of the six companies interviewed that has implemented the GED completion program. They have taken basic skills very seriously and have been willing to financially back their belief in a strong basic education. Another indication of their commitment to education is their college reimbursement program for all employees.

They have many layers of management, but most are paid hourly. This implies that a line operator has much upward mobility within the organization if training courses are taken and multiple jobs are learned.

The hourly workers seemed very upbeat about the company and praised their training, especially compared with past employers. The following are statements that will help summarize Company E.

- Short orientation but ongoing integrated courses
- The use of some cross training within departments
- Centralized classroom training

- Decentralized on-the-job training
- Use of various instructors including professors, suppliers and specialists
- Strong commitment to continuing education
- Strong commitment to basic education
- Use of temporary employees for production

COMPANY F: JAPANESE OWNED

INTRODUCTION

Company F is jointly owned by two large manufacturing firms. The Midwest plant, of 457,000 square feet, is located along a major interstate. The plant sits on 104 acres of land within one hour of several cities. They produce air conditioning parts for both U.S. and Japanese automobiles with a capacity of 1.2 million units per year. Company F employs 425 full time people plus 30 temporary employees working for an employment agency. Of those, 197 are production workers and 47 represent skilled trades. Company F was established in 1989 and started production in 1990 as a non-union plant. Some of their major customers include Chrysler Corporation, Diamond Star Motors, Honda of America, New United Motor Manufacturing, Toyota Motor Manufacturing and Bavarian Motor Works (BMW) Manufacturing.

Company F has recently been in the hiring mode, especially since December 1994 when 50 new production positions were created. The Japanese companies who formed this joint venture have a total of nine additional plants in the U.S.

PROCESS FOR RECRUITMENT AND TRAINING

Recruitment and Selection Process

Company F works with a temporary agency that does pre-screening, takes the initial applications, does the initial interviewing and does some manual dexterity testing. A GED Certificate or a high school Diploma is desired, but not required for employment.

The personnel agency conducts a background check and a drug test before they even send the applications to company F. After the initial background check, company F has a more extensive follow up done by another outside agency. Candidates who are hired right away, enter a 90 day training and evaluation period as temporary agency employees.

Orientation and Training Process

Initially, when new production employees come in, they go through a two day orientation. It includes company policies, culture, benefits, community relations, product information, a plant tour, quality presentations, safety issues, waste treatment explanation, kanban systems and

lock-out training. Next, they go out to the floor and are trained on the job.

The amount of on-the-job training received varies depending on that production line they're on. Company F is currently in the process of starting a third shift on most of the lines. The training time allotted for preparing these people for the third shift has been 3 months. On January 4, 1995, they hired associates who started in April. They train on other shifts during January, February and March working with seasoned associates and become more productive as they go along. If someone is ill on their training shift, the new associate should be able to cover for them. At the end of the training period, the new associate will be rotated back to the third shift where they will be able to practice running some sample parts. New hires who are coming in on first and second shifts that are already running get started producing more rapidly because they don't have the luxury of having an extra person. All the training is done in-house, and it's delivered by various people, including the training department and managers from other departments. The associates on the line will train other associates, depending on the situation.

They do not limit training to operating machines. Specialized trainers are available for providing training in

some of the more technical areas. For example, they can go into a special training room in the plant and learn some computer applications. Over the last year, computer training has been popular with their production associates. Although they don't use those skills on their jobs, they can usually get groups to come in on Saturdays, evenings or off-time.

STRATEGIES FOR HIRING, ORIENTATION AND TRAINING

New Hire Strategies

Company F places a great deal of emphasis on the recruitment and selection process because their processes require a lot of training. They don't want to hire people who are unable to fit into the company culture. They are more interested in work ethics and positive attitudes than technical skills. They find it's a waste of time and money to hire people who don't fit into their culture, so they spend a lot more time interviewing, testing and assessing people. They conduct extensive reference checks before considering anyone for employment. Management does not base it's selections on what applicants have done for past employers, but rather how they performed their duties. Examples include outstanding attendance, a positive attitude, a good team player and the ability to participate

in a flexible manner. However, they are finding it more difficult to get an accurate read on an applicants background because of the legalities. According to the Human Relations (H.R.) Assistant Manager:

A lot of employers are afraid to say things, even positive things, but generally if an employer has had a good experience, they're more apt to talk about the positives. They say the person had good attendance. We'll say, what's good attendance? Because what's good attendance somewhere else may not be good attendance here and you have to read between the lines. If a person is reluctant to give information or says there's something you need to know about this employee but I'm not free to tell you, you get a feeling that there may be a problem. Regarding a criminal record, I think we look more for a person who lies about it than a person who has it. We have people who have been jailed and they were up front about it. We can work with that, but we are more suspicious of someone who would say that they don't and it turns out that they do.

With regard to the importance of the recruitment and training budget, the training area takes a higher priority and it would be the last thing to go, according to the H.R. Assistant Manager. She says, "It's frustrating because I have the recruitment budget also and usually when they make cuts, they'll cut the recruiting budget, but not the training budget." When they cut the recruiting budget, it's generally in advertising such as the size of the ad or the number of newspapers. It tends to make the process longer. They are not going to relax their standards, but it may take longer to

find the right person. If it is absolutely necessary to cut the training budget, they may do the same training at different locations. However, for the production associate training, cuts are rare. If anything, they keep adding to the budget for production training. The training budget is sacred at company F and the only changes tend to be increases.

Orientation/New Hire Training Strategies

Initially, when company F started operations, they used a nearby sister plant as a training resource. Consequently, their orientation program was a copy of that format. Since then, they have updated it by receiving feedback from associates who have been through orientation. The trainees write down what they learned, who they listened to and other relevant thoughts. They also had upper management sit through the orientation to get feedback from the associates. Then, they assembled a team from production, quality and maintenance to work on a new approach to orientation. They just recently went from a 2 1/2 day to a two day orientation by shortening some of the longer presentations. They constantly ask for feedback on the orientation process. If the training department feels a change is needed, they'll put together a proposal and request additional feedback. The

trainers, trainees and management would all get involved in that process.

During orientation, various teaching methods are used including some group activities, applied exercises, lecture and video tapes. Some of the courses can be taken by associates on their own time and have nothing to do with their production lines. They are offered over the weekends and include courses like counseling to improve performance, communications skills and other courses normally reserved for management. There is a lot of information presented, role playing, videos and overheads. According to the H.R. Assistant Manager, they initiate some good discussions at these voluntary classes.

When orientation is over and new employees begin to train on the floor, a production operator is typically assigned to the new person. They don't have a specific associate designated as a trainer. When a new employee is hired, all of the associates who have been working a certain minimum length of time are expected to train. When supervisors assign a trainer, they often select the best machine operator. However, the best operator doesn't necessarily make the best trainer, and they are attempting to interject a more consistent approach to these assignments.

Their goal is to find associates who are good at training, dealing with people, and know the procedures very well.

The Supervisor of the Diecast area said:

"We put them on the job, give them opportunities to work with someone else for up to 3 months. Then, we give them opportunities to work alone and to trouble shoot problems. I believe we balance it very well with what we would consider classroom training and on-the-job training. Then we have a training area for the purpose of taking them off the lines, looking over operation manuals, quality manuals and samples of parts."

Ongoing Training Strategies

Most of the training that's done inside the plant is developed by plant associates, especially dealing with machinery, equipment and operations. Programs are developed on-site and then implemented by the supervisors and team leaders, who train the associates on the line. One of the responsibilities of the team leader is to make and update training manuals, operation manuals and instruction manuals.

The generic training that every associate must learn includes quality circles, total productive maintenance (TPM), safety, understanding the acronym REACH (recognizing, evaluated and controlling hazards), and the Toyota production system (TPS). TPM and quality circles, in particular, are beyond orientation. They are both "learning as you're doing" processes that can't be taught in a two-day orientation. Trainees are given information on all of these materials during orientation.

The technical training room has robots and electrical training equipment to be used for specific training. They are set up for specific individualized training, with an abundance of technology available for associates.

When the new assembly lines were first installed, about four production associates trained in Japan. The intention was to train the trainers how to run the assembly line. When new employees were hired to run the assembly line, they had people who were already familiar with the process. On another occasion, associates were asked to do an analysis involving new machinery, including changes in the training procedures, operation manuals and quality manuals. They chose four different people to go to a robotics company for a week of specialized training. At the end of that week, those associates were ready to train other associates on the new machinery.

Typically, when they have special projects, associates are sent to Japan. The press area just started production in December of 1994 and about a half dozen associates were sent to Japan for training. The group included general maintenance, diecast maintenance and production team leaders. During that period, they were installing machines and getting everything running.

The plant is working feverishly to follow the concept of total productive maintenance (TPM). TPM essentially makes the production line associate responsible for routine maintenance on their machine. There are still major repairs that have to be done by maintenance. Rebuilds and replacements of certain large items are still done by maintenance, so there will always be a need for the maintenance crews. The associates will be trained well enough to accept the responsibility of the machines on a daily basis.

Company F has a training guide created by the training department, in total productive maintenance (TPM). They have instructors' materials available to train the trainers, usually the assistant team leaders. In the last six months of 1994, they have offered TPM classes, including some challenging lubrication sessions. The TPM leaders train both in the classroom and on the floor.

In 1994, they contracted with the North American Diecasting Association to come into Company F with a series of training modules that relate strictly to diecasting. The associates in the diecasting department were trained during the plant shut-down, where they delivered two days of training with 5 different modules. The objective was to increase the associates' awareness of the diecasting process, introduce quality activities related to diecasting, and

provide information on mechanical, hydraulic and pneumatic systems. According to the Diecast Foreman it was a very effective program because of the input on the mechanical, hydraulic and pneumatic aspects of the diecast machines. Because they are entering stage four of TPM at Company F, the Supervisor thought that it would be helpful to see the applications regarding stage four.

Company F has an extensive number of options for associates with a desire to become better educated. Associates may attend the local community college where company F has developed an affiliation. They can remain a production associate or they can sign up for the tuition reimbursement and attend college with a degree of their choice. They have a tuition reimbursement program that will pay up to \$2,000 a year.

In the diecast department, there are six associates who have taken pre-promotion training. The results help determine, based on test scores, which associates are promotable. The pre-promotion training is not required to be eligible for a promotion. Some people are so outstanding in their area that they may be offered a promotion without the training. Others are good associates, have proven their potential, and take the pre-promotion training to further enrich themselves. That allows management to see a different

part of their academic training, and provides a vehicle to make solid judgments. However, the company never discourages anyone from taking the pre-promotion training.

To further develop the associate, the company provides voluntary classes on the weekends. The voluntary management style classes are often full. The people who really need training for the job would be given priority over those taking courses voluntarily. They usually offer these courses for six weekends in a row. A different person teaches every weekend, depending on the course. They offer these courses twice a year, so associates can be involved in more stimulating things than running a machine on a production line. They consistently get full groups even though they attend these classes on their own time and without pay.

OUTCOMES

Benchmarking

Company F has a group of sister companies, which functions as a training group called the consortium. Representatives from each of these companies usually meet twice a year, sometimes more frequently. They talk about what they are currently doing in training, including what they have studied and read. The meeting locations are rotated between the different companies. There are over 10

representative plants, some of which are located outside the U.S., including Australia and Canada. Each of the affiliates prepares a short presentation regarding current training and new training ideas for the future.

Company F has conducted extensive joint training with other plants. When Company F was still in the pre-production phase, their press team leader attended a related plant in the Midwest for a week of training on their presses. The arrangements were negotiated through the cooperative efforts of both training departments. The affiliate Training Manager came to Company F to interview associates and set up a training program.

Attitudes

The general consensus from both new trainees and experienced associates was similar. One new male associate said, "I've never experienced any better training. Nobody has ever given me more than a week of training so 90 days seems like plenty of time for anyone to learn the process." One of the new trainees commented, "I've had a lot of trouble. I think the problem was my trainer, but I'm fine now. Your attitude about your job depends on your trainer because one woman wrote things down for me and I learned most of my job in a day." Other miscellaneous remarks with regard to the quality of training were: " It's the best training I've ever

seen. If you have a problem, you go talk to your boss and he will help you. I think they are doing a great job. They are safety conscious."

The attitudes of the experienced associates were excellent. When asked about management training as opposed to production training, a female associate responded, "I think they spend more on training in the plant. I think you're learning something every day, because you're finding new things you have to know, and you're constantly training." Another woman with longer tenure said, "I couldn't believe a company could spend that much time and money on a person. They've invested a lot in us." Finally, a woman who had been with Company F several years commented, "I was amazed at this place when I came. They paid for books, training and schooling, plus they paid us our hourly wages while we were training."

Quantitative/Measurable Outcomes

One major outcome that can affect product quality, productivity and a host of other benchmarks is the turnover rate. At company F the turnover rate is less than 1%, which is lowest of the six researched companies.

Company F maintains a productivity measure called the total production ratio (TPR), which they use as a measurement for training. However, their primary device for measuring

training is a training implementation sheet and a training follow-up sheet, which team leaders are required to fill out. They evaluate associates based on what they have accomplished to date. They are given a documented test about twice a year. The test is designed to be repetitive to ensure that they have not forgotten their operations.

The Superintendent of Technical Skills Training (TST) referenced two separate cases where quantitative savings were realized. The first case involved the cost of sending robots back to Japan to be rebuilt. It would cost \$10,000 with five months of downtime for each robot sent back to Japan. The Superintendent of TST received information from a sister plant on how to repair and maintain the robots and trained the maintenance associates. Today, no robots are sent back to Japan. Their costs have dropped to \$3,000 and the downtime dropped from five months to one week.

The second case involved programming the machines. The Japanese thought that associates at Plant F were not trained enough to perform program changes on some equipment. The Superintendent of TST again arranged for training on programming changes. Now, instead of calling in a coordinator, the associate can make immediate changes. This lowered downtime for changes from about three hours to one minute.

One of Company F's trainers commented on the relationship between defects and training. She indicated that charts are kept on each employee, and when a fully trained associate runs production, the number of defects are significantly lower.

The Superintendent of TST gave some insight regarding the success of training. He focuses on the post-test because their previous knowledge is relatively unimportant. What is retained after training is significant. Another strategy used by the Superintendent of TST involves observation. Two or more weeks after the training, he observes associates and asks them questions about their training.

SUMMARY OF COMPANY F FINDINGS

Company F has an elaborate recruitment process. They spend more time and money than the other five companies on background checks and general testing. They are very particular about whom they hire. The following statements summarize the findings for Company F.

- A temporary agency does pre-screening, application, interview, manual dexterity test, background check and drug test.
- A high school diploma or GED is desired but not required.

- If hired, a production associate is an employee of the temporary agency for 90 days.
- A two day orientation is required for production associates followed by a three month on-the-job training period.
- Training may be taken in technical areas such as computer applications.
- The training budget is sacred to Company F and would be the last thing to be cut.
- A nearby affiliate plant has been used as a training resource.
- Voluntary courses can be taken by associates on weekends or other non-working hours including many management style courses.
- Every associate must learn generic training, which includes quality circles, TPM, REACH and TPS.
- Company F has a technical training room with robots and specialized electrical training equipment.
- Since the company started operations in 1990, many associates were sent to Japan for training.
- Associates may take pre-promotion training to help determine who is promotable.
- Company F is a member of a consortium for over ten affiliate companies where training ideas are shared.

They meet twice a year and all make short presentations regarding current and future training.

- Their employee turnover rate is less than 1%, the lowest of the six researched companies.
- Company F measures the effectiveness of training by using a productivity measure called total production ratio (TPR). They also use a training implementation and follow-up sheet to evaluate training.
- Robots are repaired by maintenance, on-site, saving the company thousands of dollars in repair costs and downtime.
- Machine programming is now performed by operators lowering downtime from three hours to about one minute.

SURVEY FINDINGS

This section contains statistical findings of the research based on a one page survey (Appendix I) which was completed by each interviewee. The statistical findings are primarily descriptive. The following results are only a small part of the study and are included for the following two reasons: (1) to get the interviewee in the mood for the hour long face-to-face interview, and (2) to gather superficial data regarding their general response to the eight research

questions. The results are calculated using Minitab Statistical Software version 7.2.

SURVEY

The survey questions were asked using a discrete, ordinal scale of measurement from one to ten. A value of one implies strong disagreement and a value of ten implies strong agreement. No survey questions were asked about research questions three and seven. The survey questions are related to the basic research questions in the following way:

Research question 1: How much emphasis is placed on the recruitment and selection of new production employees?

Related survey question 4: The screening process for applicants is extremely thorough.

Research question 2: How much and what kind of training is expected of new production employees?

Related survey question 2: The amount of training given to new employees is appropriate.

Related survey question 9: Career development is discussed and encouraged.

Research question 4: How much commitment and support does the organization give to its training program.

Related survey question 1: Training is given top priority at this facility.

Research question 5: How is the training organized and delivered?

Related survey question 7: Trainers are well qualified and produce positive results.

Research question 6: Can training effectiveness be determined?

Related survey question 3: The quality of training given to new employees is the best in the industry.

Related survey question 5: Benefits of training at this facility far outweigh their costs.

Related survey question 8: Cross training, if used at your plant, results in well trained employees and high quality products.

Research question 8: What role does Adult and Continuing Education play in these programs?

Related survey question 6. The instructional methods used are appropriate for the tasks.

Related survey question 10: This plant effectively uses mentors to assist new employees.

STATISTICAL METHODS

The primary concern of this research is to determine if the answers to the questionnaires are the same for Japanese and U.S. suppliers. To determine this, inferences have been made concerning the differences in the two population means. The populations are defined as the three Japanese companies or the three U.S. companies. Using Minitab, each of the ten survey questions were separated into two groups to determine the difference in the population means. For each of the ten questions, means by country and differences in means are in the following Table 4.1 and also in Appendix J.

Table 4.1
Statistical Results by Country

Survey Question	N US	N Japan	Mean US	Mean Japan	Mean Diff.
Training is given top priority.	35	39	7.4	7.7	-.3
Amount of new employees training appropriate.	34	39	7.6	7.3	.3
Quality of training is best in the industry.	32	38	6.7	7.3	-.6
Screening process is extremely thorough.	34	39	6.8	8.1	-1.3
Benefits of training far outweigh their costs.	34	39	8.2	8.1	.1
Instructional methods are appropriate for tasks.	35	39	7.9	7.6	.3
Trainers are qualified & produce good results.	34	39	7.9	7.8	.1
Cross training improves employees and products.	32	38	8.0	8.6	-.6
Career development is discussed and encouraged.	35	38	6.1	6.2	-.1
This plant effectively uses mentors.	34	38	7.3	7.5	-.2

SUMMARY

With regard to Table 4.1, there are two areas where the employees of Japanese companies feel they have an advantage over their U.S. counterparts. They feel the screening process for new employees is more thorough and there is some evidence that cross training has been used more effectively to produce a better trained employee and higher quality products. There is no evidence to suggest that the employees of U.S. companies feel that they have an advantage regarding any of the ten statements.

Qualitative and quantitative research results have been presented in chapter four. The summary of findings, conclusions and recommendations will be discussed in chapter five.

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

The following summary of findings, conclusions and recommendations highlight the completed research and possibilities for further research regarding the topic: Exploring and identifying similarities and differences in training processes, strategies and outcomes between U.S. located Japanese and American automobile industry suppliers. In this study, only top rated plants were researched and the specific focus was on new employee training programs. Table 5.1 provides an overview of the findings.

SUMMARY OF FINDINGS

Based on the transcribed interview data, the following Table 5.1 compares 15 attributes of the six companies. The comments following the table will address, compare and evaluate the categories in Table 5.1. Any reference to Japanese transplants, U.S. plants or U.S. firms should be interpreted as automobile supplier plants only. Any reference to employees should be interpreted as production employees.

TABLE 5.1
Comparative Training Data

	<u>Company A</u>	<u>Co. B1/B2</u>	<u>Company C</u>	<u>Company D</u>	<u>Company E</u>	<u>Company F</u>
Japanese/U.S.	U.S.	U.S.	Japanese	Japanese	U.S.	Japanese
Union	No	Yes/No	No	No	No	No
Plant Age	10	25-30	9	8	49	6
Avg. Age	25	41	32	32	30	No data
No. Prod. Workers	547	324/311	360	456	1000	274
HS/GED Req.	Yes	No	Yes	Yes	Must Obtain	Preferred
Basic Skills Test	No	No	Yes	No	No	Yes
Orientation Length	1 day	part day	5 days	3 days	2 days	2 days
Classroom Training	0	0	5 days	5 days	5 days	2 days
OJT Train.	3 weeks	1-4 weeks	26 weeks	6 weeks	3 weeks	13 weeks
Additional Classes	Minimal-Varies	Minimal-Varies	Plan 40 Hrs./yr.	10 Hrs./yr.	Varies	65 Hrs./yr.-var.
Temporary Empl.	No	No/Yes	No	No	Yes	Yes
Training Comm.	Yes-Each Dept.	Yes	Yes	Yes	Yes	Yes
Empl. Turnover	Approx. 40%	Approx. 10%	Approx. 20%	less than 2%	5-10%	less than 1%
Cross Training	Limited	Yes	Yes	Yes-Some	Yes-Some	Limited

COUNTRY OF ORIGIN

Companies A, B, and E are wholly U.S. owned and operated. Companies C, D, and F are Japanese firms. Company B offered two plants for review that were coded B1 and B2.

UNION VERSUS NON-UNION

All plants are non-union except plant B1, therefore, the results are not skewed because of this characteristic. Plant B1 has many similar characteristics to the other five plants, however, they lack work force flexibility. For example, plant B2 used temporary employees while plant B1 used only permanent workers.

PLANT AGE

The average age of the U.S. plants is 29 years while the Japanese plants averaged eight years. This is expected due to the recent movement of Japanese transplants to the U.S. The general implication that modern capital in Japanese plants leads to more technical training is not the focus of this study.

AVERAGE AGE OF PRODUCTION EMPLOYEES

The average age of the sampled U.S. plants and Japanese

plants is about the same at 32 years. The study of automobile assembly plants may reveal a larger difference in average age. The U.S. firms would likely have older workers than their U.S. located Japanese counterparts due to significant layoffs in U.S. assembly plants without replacements.

NUMBER OF PRODUCTION WORKERS

The number of production workers in U.S. plants sampled ranged from 311 to 1000, while production workers in the Japanese plants ranged from 274 to 456. Company E with one thousand employees, significantly raised the U.S. average. Larger plants may have additional resources for hiring, orientation and training.

HIGH SCHOOL OR GED REQUIREMENT

The Japanese companies were more concerned about basic educational requirements. Only one Japanese company did not require a high school diploma or GED; however, they are strong advocates of a basic education. Two of the U.S. companies did not require a high school or GED, but Company E had a GED completion program at the plant. They require that a new employee concurrently acquire a GED.

BASIC SKILLS TEST

None of the U.S. firms required a basic skills test to be considered for employment. Two of the three Japanese firms required a basic skills test. This was a major difference in hiring techniques that differentiated the two groups. The Japanese firms accepted fewer applicants than their U.S. counterparts and used basic skills testing to identify qualified candidates.

LENGTH OF ORIENTATION

The average orientation length for the sampled U.S. companies is slightly more than a day. The Japanese companies averaged more than three days. Company F, a Japanese plant, had recently decreased their orientation length by one-half day. The Japanese plants have a more structured orientation with more emphasis on safety, maintenance, company philosophy, community relations, and specialized topics such as *kanban* and *kaizen*. The U.S. companies covered some of these topics in their orientation or ongoing departmental training.

DEPARTMENT CLASSROOM TRAINING

Classroom training in the new employee's department is beyond orientation classroom training. Only one U.S. plant

used classroom training to train the employee for their new position. Company E incorporated a full week of classroom training into their departmental training. All three Japanese companies used a classroom for specific job training with an average of four days. Again, the Japanese plants were more structured in their training approach for new hires. Examples of job related courses in the classroom include total productive maintenance, statistical process control, production systems, safety and specific product information classes.

ON-THE-JOB TRAINING

The number of weeks of on-the-job training for U.S. companies ranged from one to four weeks, versus a range of six to 26 weeks for the Japanese companies. The Japanese companies sampled, on average, devoted more of their resources to initial training for newly hired employees. Regarding the six observed companies, all are excellent in quality, cost containment and timely order processing. Given the qualitative nature of this research, it is difficult to determine how the additional training might benefit the sampled Japanese companies. In chapter four, a statistical evaluation regarding the companies dedication to training was presented. In this evaluation, specific employees were polled

to detect the comfort level in their prospective training programs.

ONGOING CLASSES OFFERED

Ongoing classes offered refers to voluntary or required classes provided to the employee for needed training, job enrichment, or personal benefit. The Japanese companies were more specific in the amounts and types of ongoing training offered to their production employees. The Japanese companies averaged about 38 hours of ongoing annual training. The course offerings from the U.S. companies were minimal with some exceptions. Again, the Japanese companies were more structured in their approach to continuing education and training. This does not necessarily suggest inferior training. The U.S. firms have various programs in place and may be planning more structured training. For example, Company E builds upon its new employee courses by offering an advanced version of statistical process control and preventive maintenance. They also offer a blueprint reading course and quality circle involvement. Company B is implementing ISO 9000, an international standard for training.

USE OF TEMPORARY EMPLOYEES

The Japanese and U.S. firms sampled were about equal in their use of temporary employees. Company E, a U.S. company, uses temporary employees with a 90 day non obligatory contract. Company B, plant B2 uses supplemental help for 20-25% of their hourly work force. They believe it is extremely cost effective and nearly guarantees excellent permanent workers. Permanent workers are chosen from the best of the supplemental work force. Company F is the only Japanese company to use temporary help. Their reason for using temporary help is to avoid possible legal problems and to evaluate people for 90 days before becoming permanent. Based on the interviewees' responses, temporary employees have many advantages and few disadvantages.

TRAINING COMMITTEES

All six companies used some form of a training committee. Company A has formed training committees at two levels. Trainers from all three departments meet once or twice a month. Additionally, supervisors regularly meet with trainers for each shift, within each department. Plant B1 has a steering committee consisting of project engineers, the union president and the shop steward. This group is responsible for forming a training needs team. Also, plant B2

uses an employee involvement group where training topics are often discussed. Company C has an informal approach to training issues involving Department Managers, Production Manager and Production Trainer. The Production Trainer meets with several other groups for opinions and exchanges. The training department from Company D, in 1993, conducted a competency study finding the knowledge and skills required for each job. The training department serves as a training committee using ideas from various sources. Company E uses *action circles*, consisting of production employees, to identify and solve training needs. They also employ a Manager of Training who is responsible for curriculum development and training delivery. He decides, with the help of managers and supervisors, which training needs are most critical. Company F assembled a team from production, quality and maintenance to work on a new approach to orientation. Also, their training department meets regularly to discuss training needs with the help of trainers, trainees and managers.

EMPLOYEE TURNOVER

The average production employee turnover rate for the three U.S. companies is 19%. That same rate is about 8% for the observed Japanese companies. Turnover can be attributed to the level of unemployment in a given area. Typically, as

the unemployment rate is lowered, the turnover rate increases. However, in all six areas the unemployment rate is under the national average. Low employee turnover reflects careful recruiting and attention to employee development given a market driven wage level. In this study, the Japanese companies have an average turnover rate which is less than half of their U.S. counterparts. To fairly compare turnover rates, a larger sample size and pairing of plants with similar products are needed.

CROSS TRAINING

Cross training in the two groups is about equal. Two companies, Japanese and U.S., had formal, well-organized cross training. Company B, plant B2, employed a rotational system that allowed workers to switch jobs hourly. Within 90 days, Company C trains new employees in every area of their specific department.

Two companies, Japanese and U.S., were less structured in cross training. Company D previously cross trained, but cut back on their efforts when production increased. Company E uses some cross training within departments at the manager's discretion. Companies A and F do not regularly cross train. None of the six companies cross trained on a plant wide level. All six companies expressed a desire to

increase cross training. Some had even discussed plant wide cross training.

CONCLUSIONS

Using the eight original research questions the following conclusions were reached. All questions and conclusions are in regard to comparisons between Japanese and U.S. firms.

Question 1: How much emphasis is placed on the recruitment and selection of new production employees?

Conclusion: Japanese transplants place more emphasis on recruitment and selection of new employees.

Question 2: How much and what kind of training is required of new production employees?

Conclusion: Japanese transplants require production employees to attend longer orientation training and department specific classroom training than U.S. plants.

Question 3: Who is responsible for identifying training needs and how are these needs identified?

Conclusion: Managers, trainers, supervisors and production employees all take an active part in identifying training needs in both Japanese transplants and U.S. plants.

Question 4: How much commitment and support does the organization give to its training program?

Conclusion: Both U.S. plants and Japanese transplants receive appropriate commitment and support from all managerial levels with regard to training needs.

Question 5: How is the training organized and delivered?

Conclusion: Training is usually organized by a training manager or department supervisor and delivered by all ranks of employees from production to management. There appears to be no major difference in Japanese transplants and U.S. plants with regard to training organization and delivery.

Question 6: Can the effectiveness of training programs be documented, and how do companies evaluate effectiveness?

Conclusion: If measured by employee turnover, Japanese transplants are more effective in this area. The turnover rate for U.S. plants was more than double the turnover rate for Japanese transplants. No definitive conclusions can be made with regard to training effectiveness due to the descriptive nature of this study.

Question 7: Who determines the training needs for the future and what process is used to determine these needs?

Conclusion: Both Japanese transplants and U.S. plants actively use training committees to determine future training needs. Also, both tend to rely on input from all employee ranks including production.

Question 8: What role does Adult and Continuing Education play in these programs? (instructional design, evaluation, follow-up, etc.)

Conclusion: Both Japanese transplants and U.S. plants use adult methods of instruction in their training programs. These include group discussions, role playing and hands-on training.

OTHER CONCLUSIONS

Other conclusions were relevant to the study but did not precisely fit the research questions.

Based on this study, U.S. owned plants are substantially older than Japanese transplants. Also, the average age of production employees in U.S. plants appears no different than Japanese transplants. Age of the plant may affect training due to more technologically updated plant and machinery. The average age of production employees can be related to

previous layoff patterns and early retirement programs.

Japanese transplants require their production workers to hold a higher level of basic education than in U.S. plants. Higher basic education allows employers to train at a more advanced level. Basic education also requires a smaller investment to bring the employee to a minimum level of required knowledge. With regard to basic skills, Japanese transplants have higher standards for employment than U.S. plants. These higher standards may reduce problem employees resulting in lower turnover and absenteeism.

Japanese transplants require more on-the-job training than U.S. plants. Releasing employees into production before they are fully trained can result in injuries and quality problems. Additionally, Japanese transplants offer more voluntary and employee development training on an ongoing basis than U.S. plants. Employee development training may increase self esteem and prepare employees for promotions. It may also give the employee a sense of belonging, which can be transferred to a quality driven work place.

Japanese transplants use temporary employees as frequently as U.S. plants. Temporary employees can assist the employer in controlling labor costs. However, training dollars may be wasted when temporary employees are no longer needed.

Finally, Cross training within departments is used extensively in both Japanese transplants and U.S. plants. Cross training allows companies to operate at peak efficiency due to a flexible work force.

RECOMMENDATIONS AND CONCLUDING REMARKS

Some major differences were found in recruitment techniques, recruitment costs, background checks, skills testing, and various other investigative techniques. The Japanese firms, on average place a higher priority on recruitment. Another major difference is found in training duration. In all three areas, orientation length, classroom training and on-the-job training, the Japanese firms made a greater time commitment. Also, average employee turnover for the three Japanese firms was substantially lower than the average U.S. firm.

The statistical findings based on the questionnaires were less conclusive. There is evidence that Japanese employees believe their screening process for applicants is more thorough than the U.S. companies. There is also evidence, although weaker, that Japanese company employees believe cross training in their plant results in better trained workers and higher quality products than U.S. companies.

Conclusions regarding the statistical analysis of the questionnaires are as follows:

- The screening process for Japanese automotive transplants (JAT's) is more thorough as compared with U.S. plants (USP's).
- JAT's use cross training more effectively than USP's.

The six companies researched are as much different within country of origin as between countries of origin. These two areas, differences in rank and differences between companies of the same national origin suggests a need for further research.

In addition to rank and origin, the number of training dollars invested by Japanese and U.S. manufacturing companies could be compared. Those dollars, however, are difficult to obtain due to the treatment of training in corporate budgets. As this researcher found, most companies do not separate on-the-job training as a separate expense.

Finally, a regression model could be constructed to find the effect of training on the number of product defects. For example, a sample could be drawn from companies initiating additional training hours to determine the effect on defects. Both U.S. and Japanese companies could be sampled to detect any differences in the quality of training. An additional

training hour in a Japanese company may have a different effect on quality than an additional hour of training in a U.S. company.

The findings were much different than this researcher expected. A more significant difference was expected regarding employees opinions about training. The U.S. companies are using many techniques that are traditionally Japanese and are quite successful. The gap in training and recruitment is closing based on the findings of this research. U.S. companies are finding value in training and taking advantage of its benefits.

REFLECTIONS

In the beginning of the study, I expected to find more significant differences between the U.S. and Japanese training hours, employee composition, content of orientation, recruitment procedures and many other training characteristics. At the end, I found that the U.S. firms were working very hard to recruit the right worker, train effectively, produce high quality parts, maintain a clean, safe working environment, and still keep their costs down from the prior period. The Japanese companies seemed to be better structured to do all these things but the U.S. companies are meeting the high standards of many automotive

companies. The bottom line seems to be the same for all six companies, but they achieved these high standards in different ways.

One major observation was prevalent throughout this study. In both the taped interviews and questionnaires, the six companies were as much different within country of origin as between country of origin. The averages showed that the Japanese transplants had higher basic education requirements, longer training requirements and lower employee turnover, but the variance within each group was extremely large. To expand this study, a larger sample size would be a major benefit. One of my observations from each group may have been an outlier, therefore it could be excluded with a larger sample. Also, a larger sample could produce other more refined statistical results.

Finally, the biggest lesson that can be learned from this research is that this study has only touched on the possible findings that could be obtained regarding the topic of comparative international training programs. Expanding this research to other industries, specific quantitative measures or a global sampling of companies could result in both domestic and international interest. The interested parties would likely be globally competitive companies based in highly industrialized countries. Many companies fitting

this description may have a strong desire to compare the best training programs in the world and emulate their desirable characteristics. This study has revealed the researcher from within me and has served as the appetizer in an expensive, but delicious, multiple course meal.

APPENDIX A

U.S. Transplant Facts

Foreign Final Assembly Plants

(1994) Wards Automotive Yearbook

Name	Launch Date	Location	Employment	Ownership
Auto Alliance Intl., Inc.	1987	Flat Rock	3800	Ford 50% Mazda 50%
BMW Mfg. Corp.	1994	Greenville, S.C.	1000 (by 1995)	BMW 100%
Diamond Star Motors Corp.	September, 1988	Normal, Ill.	3100	Mitsubishi 100%
Honda of America Mfg., Inc.	Motorcycles 1979, Cars 1982	Marysville, OH E. Liberty, OH Anna, OH.	10,000	Honda 100%
Mercedes Benz Project, Inc.	1996-97	Vance, AL	Unknown	Daimler-Benz 100%
New United Motor Mfg., Inc.	1984	Fremont, CA	4300	GM 50% Toyota 50%
Nissan Motor Mfg. Corp.	1983	Smyrna, TN	5900	Nissan 100%
Subaru-Isuzu Automotive, Inc.	1989	Lafayette, IN	1900	Fuji 51% Isuzu 49%
Toyota Motor Mfg., USA, Inc.	1988	Georgetown, KY	6000 (by 1996)	Toyota 100%

APPENDIX B

SEQUENCE OF EVENTS

1. Recruitment

1a. Contact Director, J Car Planning, Program Quality Implementation Department at General Motors.

1b. Director of J Car Planning agrees to participate in research. Contacts Purchasing Department at Lansing General Motors location.

1c. Purchasing Department identified the list of automotive suppliers who met the criteria listed in the methodology.

1d. Contact persons at the suggested plants were listed by Purchasing Department including phone numbers and addresses.

2. Verification Process

2a. Researcher located supplier information in the Michigan Manufacturers Directory or the manufacturers directory in the state where the plant is located.

2b. All relevant information was verified to ensure criteria was met and possible non-compliant plants were eliminated from the list of potential interviewees.

3. Seek Supplier Approval

3a. Researcher wrote and followed up with a phone call each contact person to explain the purpose, their actual and potential benefits, and the amount of time required to complete the interviews.

3b. Suppliers who agreed to be researched were scheduled for an interview.

3c. Researcher sent a follow-up letter confirming the date and time of the interview.

3d. A phone call was made to each supplier to confirm the date and time. A few questions were also asked

regarding the company which saved time and allowed the researcher to better prepare the interview process.

4. The Interview Process

4a. The interview guides provided the basic framework for the interview sessions.

4b. Three separate interview guides were administered. Guides are designed for managers, trainers and trainees.

4c. At least three upper level managers, one trainer and eight trainees were interviewed.

4d. Some groups were formed to save time and contribute to discussions.

4e. The sessions lasted approximately one hour.

4f. If approved by the various plants, each session was recorded and some answers were written for backup.

5. Analysis of Data

5a. Researcher clustered data around central themes.

5b. Training processes, strategies and outcomes were identified, clustered into central themes and then compared.

5c. The entire group of Japanese suppliers were then compared to the entire group of American firms using central themes indicated in 5b.

5d. Quantitative data was analyzed using the Minitab statistical package. Means, medians, standard deviations, frequency counts, frequency distributions, standard errors, quartiles and differences in sample means were calculated for any quantitative data.

APPENDIX C
CLASSIFICATION OF INTERVIEW QUESTIONS

#	Question	Process	Strategy	Outcome
1a	How is training funded and how is it allocated?		X	
1b	What is the source and support for training budget?		X	
1c	Are the outcomes of training benchmarked ? How?			X
2a	Do you conduct needs analysis? How?		X	
2b	How do you design instructional materials?		X	
2c	What is the origin of instructional materials?		X	
2d	How is training evaluated and linked to outcomes?			X
2e	How is training directly transferable?			X
3a	How do you use computer based training?	X		
3b	What technologies are used in training?	X		
4a	What are the characteristics of trainers?		X	
4b	What are the characteristics of trainees?		X	
5a	Which classroom techniques are used?	X		
5b	How is experimental learning used in your training?	X		
6a	What are characteristics of your skills training?	X		
6b	How is career development integrated into training?		X	

APPENDIX D

CONFIRMATION LETTER

Randall J. Lewis
1715 Thrushwood Circle
Okemos, MI 48864
Home Phone (517) 349-9143

Date

Dear Training Manager (NAME):

I am pleased to confirm our interview on [date] at [time].

By providing information about your training program and relevant performance data, you will be assisting automobile suppliers in Michigan and the entire United States in designing effective training programs. I am particularly interested in your responses since you fit the criteria which my study emphasizes.

I will be calling you to confirm our appointment and to ask a few basic questions about your firm. This survey will enable us to save time on the interview date by concentrating on more critical issues. Confidentiality will be observed, so you can be certain your responses will be separated from your identity. The phone survey has been tested and will require no more than 10 minutes to complete assuming all data is easily accessible.

I very much appreciate your time and cooperation in answering pre-interview questions and assisting me in the completion of this important study. As a symbol of my deep gratitude, I would like to offer you a summary of my research findings when completed.

Sincerely,

Randall J. Lewis

APPENDIX E

BASIC COMPANY QUESTIONS

PHONE INTERVIEW WITH SUPPLIER

1. How many people are employed at your plant?
2. Approximately how many salaried, skilled trades and production workers do you employ?
3. Do you have someone who is responsible for training? What is the title of this person?
4. Is this plant union or non-union? If union, does the union contract say anything about training?
5. Specifically, what do you produce? For who?
6. How old is your plant?
7. Have you recently been in the hiring mode? When?
8. What is the average age of your production workforce?
9. Are you part of a larger parent company?
10. How many plants does your parent company operate in the U.S.?

APPENDIX F **MANAGERS INTERVIEW GUIDE**

A. Questions Dealing with Training Administration

1. What portion of the training resources are devoted to management? Skilled labor? Production labor?
2. How do you support training of production labor?
3. Is training conducted primarily in-house or outside the of the firm?
4. For in-house training, do you provide a separate training room?
5. How does the content of training programs offered in the firms' home country differ from training offered in foreign countries?
6. How do you measure the effectiveness of training programs?
7. How do you compare your training results with those of your competitors?

B. Questions Dealing with Design, Development and Implementation

1. How do you determine who attends training?
2. How many hours per year do production employees spend in training? How is this determined?
3. How many hours of training are required for a typical newly hired employee? How do you determine this?
4. Do you conduct needs analysis studies? How do you go about this process?
5. Do you have a training committee?
6. Do you have behavioral objectives? For example: a contract between employer and employee specifying responsibilities of each party.
7. How do you determine the methods of instruction?
8. How do you develop your agenda for training?
9. Do you develop your own instructional materials?
10. If yes, specifically how do you go about designing instructional materials?
11. Are you convinced that training will produce a positive payback to the firm? Why?
12. How extensive are evaluations and follow-up on training courses?
13. Has productivity improved as a direct result of training processes and strategies?
14. Has the firm been able to track improvements in quality and output directly resulting from training enhancements?

15. Has the firm been able to implement training which has resulted in improved working relationships?

C. Questions Related to Training Technology

1. How are computers used in training and/or orientation?
2. What technologies are used in training?

D. Questions Related to Characteristics of Trainers and Trainees?

1. Are your trainers employed by the company?
2. How much of the non-trainers time is allocated to training? eg: Floor Manager conducting safety class
3. Are any specific motivational techniques used in training?
4. Are trainers rotated throughout various plants?
5. What level of education have trainees attained?
6. How do trainees learning styles differ?
7. What is their average length of service?

E. Questions Regarding Training Techniques

1. What portion of total class time is used for the following classroom technique? Group exercises? Lecture? Videotape? Applied on the job? Other?
2. Which training technique is the most effective?
3. What role does Adult and Continuing Education play in the development of these programs? (instructional design, evaluation, follow-up, etc.)
4. Specifically, what kinds of adult learning methods are used in the training programs?

F. Questions Dealing with Training Orientation Programs

1. Are basic skills training courses offered? How many employees need this type of training?
2. Is cross-training required? Please explain.
3. Is training conducted in teams? Please explain.
4. Are computer skills training courses offered?
5. How do you get employees to take charge of their careers?
6. Is there a career development path within your company?
7. Is career development considered before new employees are hired, when hired and during the orientation process?
8. How much emphasis is placed on initial and/or promotional screening of prospective or existing employees?

9. How much time passes from the initial contact the employee to the offering of full status employment?
10. Are any outside investigative firms involved in the pre-employment screening process?
11. How much does it cost on average to hire one employee when considering total screening costs?
12. Are promotional candidates screened prior to promotion?
13. Do you have a mentoring program?
14. Are employees assigned a mentor when hired or transferred?
15. If mentors are used, what criteria do you use in assigning a mentor to a new or transferred employee?

APPENDIX G
TRAINERS INTERVIEW GUIDE

A. Questions Dealing with Training Administration

1. What portion of the training resources are devoted to management? Skilled labor? Production employees?
2. Do managers support training of production labor?
3. Is training primarily in-house or outside the of the firm?
4. For in-house training, do you provide a separate training room?
5. How does the content of training programs offered in the firms' home country differ from training offered in foreign countries?
6. How do you measure the effectiveness of training programs?
7. How do compare your training results with those of your competitors?

B. Questions Dealing with Design, Development and Implementation

1. How do you determine who attends training?
2. How many hours per year do unskilled production employees spend in training? How is this determined?
3. How many hours of training are required for a typical newly hired employee? How do you determine this?
4. Do you conduct needs analysis studies? How do you go about this process?
5. Do you have a training committee?
6. Do you have behavioral objectives? For example: a contract between employer and employee specifying responsibilities of each party.
7. How do you determine your methods of instruction?
8. How do you develop your agenda for training?
9. Do you develop your own instructional materials?
10. If yes, specifically how do you go about designing instructional materials?
11. Are managers convinced that training will produce a positive payback to the firm?
12. How extensive are evaluations and follow-up on training courses?
13. Has productivity improved as a direct result of training processes and strategies?
14. Has the firm been able to track improvements in quality and output directly resulting from training enhancements?
15. Has the firm been able to implement training resulting in improved working relationships?

C. Questions Related to Training Technology

1. How are computers used in training and/or orientation?
2. What technologies are used in training?

D. Questions Related to Characteristics of Trainers and Trainees?

1. Are you employed by the company?
2. How much of the non-trainers time is allocated to training?
3. Do you use any specific motivational techniques in training?
4. Are you rotated throughout various plants?
5. What level of education have trainees attained?
6. How do trainees learning styles differ?
7. What is their average length of service?

E. Questions Regarding Training Techniques

1. What portion of total class time is used for the following classroom technique? Group exercises? Lecture? Videotape? Applied on the job? Other?
2. Which training technique is the most effective?
3. What role does Adult and Continuing Education play in the development of these programs? (instructional design, evaluation, follow-up, etc.)
4. Specifically, what kinds of adult learning methods do you use in the training programs?

F. Questions Dealing with Training Orientation Programs

1. Are basic skills training courses offered? How many employees need this type of training?
2. Is cross-training required? Please explain.
3. Is training conducted in teams? Please explain.
4. Are computer skills training courses offered?
5. How do you get employees to take charge of their careers?
6. Is there a career development path within your company?
7. Is career development considered before new employees are hired, when hired and during the orientation process?
8. How much emphasis is placed on initial and/or promotional screening of prospective or existing employees?
9. How much time passes from the initial contact the employee to the offering of full status employment?
10. Are any outside investigative firms involved in the pre-employment screening process?
11. How much does it cost on average to hire one employee when considering total screening costs?
12. Are promotional candidates screened prior to promotion?
13. Do you have a mentoring program?

14. Are employees assigned a mentor when hired or transferred?

15. If mentors are used, what criteria do you use in assigning a mentor to a new or transferred employee?

APPENDIX H
TRAINEES INTERVIEW GUIDE

A. Questions Dealing with Training Administration

1. Do managers support training of production labor?
2. In your opinion, are more of the training resources devoted to management, skilled labor or production labor?
3. Is training primarily in-house or outside the of the firm?
4. For in-house training, are you provided a separate training room?
5. Compare and contrast your training programs offered this firm compared with training offered by past employers?
6. Can you measure your personal benefit as a direct result of this firms training programs?

B. Questions Dealing with Design, Development and Implementation

1. What kinds of training do you attend and who determines your participation in training?
2. How many hours do you spend in training per year?
3. Do you have a contract between you and your employer specifying responsibilities of each party?
4. Are managers convinced that training will produce a positive payback to the firm?
5. How extensive are evaluations and follow-up on training courses?
6. Has your productivity improved as a direct result of company sponsored training? Which are most effective?
7. Have you been able to track improvements in quality and output directly resulting from training enhancements?
8. Have been exposed to training which has resulted in improved working relationships for you or your coworkers?

C. Questions Related to Training Technology

1. How do you use computers in training and/or orientation?
2. What kinds of technologies have you been exposed to while training?

D. Questions Related to Characteristics of Trainers and Trainees

1. Are all trainers employed by the company?
2. Were you rotated throughout various plants when training?
3. What level of education have you attained?
4. Are you aware of learning styles differences?
5. How long have you worked for this company?

E. Questions Regarding Training Techniques

1. What portion of total class time is used for the following classroom technique? Group exercises? Lecture? Videotape? Applied on the job? Other?
2. Which training technique was the most effective for your learning style?
3. Specifically, what kinds of adult learning methods were used in the training programs?

F. Questions Dealing with Training Orientation Programs

1. Are basic skills training courses offered? Did you need basic skills training?
2. Did you cross-train? Please explain.
3. Were you trained in teams? Please explain.
4. Were you offered a computer skills training course?
5. How were you encouraged to take charge of your career?
6. Were you informed of career development choices before you were hired, when hired and during the orientation process?
7. Are you presently on a career development path?
8. When making an application to this company, how much time passed from your initial contact to the offering of full status employment?
9. Were you investigated by an outside firm during the pre-employment screening process?
10. If promoted, were you screened prior to promotion?
11. Do you have a mentoring program?
12. Were you assigned a mentor when hired or transferred?
13. If mentors are used, who was your mentor and was he/she effective? Why?

APPENDIX J

STATISTICAL OUTPUT

Both populations without coding by country:

	N	N*	MEAN	MEDIAN	TRMEAN	STDEV	SEMEAN
q1	74	0	7.541	8	7.887	1.917	0.223
q2	73	1	7.438	8	7.585	2.034	0.238
q3	70	4	8.871	7	7.113	2.371	0.283
q4	73	1	7.438	8	7.6	2.179	0.256
q5	73	1	8.137	8	8.282	1.843	0.216
q6	74	0	7.743	8	7.924	2.007	0.233
q7	73	1	7.883	8	8.015	1.838	0.215
q8	70	4	8.271	8	8.371	1.383	0.166
q9	73	1	6.151	7	6.2	2.52	0.285
q10	72	2	7.375	8	7.594	2.514	0.296
	MIN	MAX	Q1	Q3			
q1	2	10	6.75	9			
q2	2	10	7	9			
q3	1	10	5.75	9			
q4	1	10	6	9			
q5	1	10	7	10			
q6	2	10	7	9			
q7	2	10	7	9			
q8	5	10	8	9			
q9	1	10	4	8			
q10	1	10	6	9			

Statistical Output when coded by country of origin:

	cn	N	N*	MEAN	MEDIAN	TRMEAN	
q1	1	39	0	7.41	7	7.457	
	2	35	0	7.686	8	7.903	
q2	1	39	0	7.59	8	7.657	
	2	34	1	7.265	8	7.433	
q3	1	38	1	6.684	7	6.735	
	2	32	3	7.313	8	7.536	
q4	1	39	0	6.846	7	6.914	
	2	34	1	8.118	8.5	8.333	
q5	1	39	0	8.154	8	8.257	
	2	34	1	8.118	8	8.333	
q6	1	39	0	7.872	8	7.943	
	2	35	0	7.6	8	7.806	
q7	1	39	0	7.923	8	8	
	2	34	1	7.794	8	8.033	
q8	1	38	1	8.026	8	8.088	
	2	32	3	8.562	8.5	8.643	
q9	1	38	1	6.132	7	6.118	
	2	35	0	6.171	6	6.256	
q10	1	38	1	7.289	8	7.441	
	2	34	1	7.471	8	7.733	
	cn	STDEV	SEMEAN	MIN	MAX	Q1	Q3
q1	1	1.551	0.248	4	10	7	8
	2	2.272	0.384	2	10	8	10
q2	1	1.728	0.277	4	10	7	9
	2	2.352	0.403	2	10	6.5	9
q3	1	2.279	0.37	2	10	4.75	8.25
	2	2.468	0.436	1	10	6.25	9
q4	1	2.231	0.357	2	10	5	9
	2	1.935	0.332	1	10	7.75	9.25
q5	1	1.785	0.288	4	10	7	10
	2	1.935	0.332	1	10	7	10
q6	1	1.704	0.273	4	10	7	9
	2	2.316	0.362	2	10	7	9
q7	1	1.707	0.273	4	10	7	10
	2	1.997	0.342	2	10	7	9
q8	1	1.461	0.237	5	10	7	9
	2	1.268	0.224	5	10	8	10
q9	1	2.042	0.331	2	10	5	8
	2	2.985	0.505	1	10	4	9
q10	1	2.415	0.382	1	10	6	9
	2	2.654	0.455	1	10	5.75	9.25

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