DOCUMENT RESUME

ED 372 254 CE 066 868

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TITLE	Models of Excellence: A Review of Ohio's Award-Winning Workplace Literacy Programs. Alliance for Workforce Excellence Publication #94-01.
INSTITUTION	Ohio State Bureau of Employment Services, Columbus.
PUB DATE	Jun 94
NOTE	62p.
AVAILABLE FROM	Ohio Bureau of Employment Services, Office of Workforce Development, 145 S. Front Street, Room 678, Columbus, OH 43215 (free).
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	Adult Basic Education; *Adult Literacy; Adult Programs; *Awards; Demonstration Programs; Employer Employee Relationship; *Inplant Programs; Job Skills; *Literacy Education; *On the Job Training
IDENTIFIERS	*Ohio; *Workplace Literacy

ABSTRACT

This report summarizes the 18 programs that have received Governor's Workforce Excellence Awards in Ohio over the past 3 years. The 18 award winning programs (based in companies employing from 75 to 16,000 employees) focus on the basic literacy, thinking, and personal skills that every Ohio worker must possess. They were selected from nearly 100 public and private employers, representing more than 175,000 Ohio workers, that were nominated for the award. Each of the award-winning programs are described in terms of five basic components: (1) developing stakeholder support; (2) assessing workplace skills; (3) designing the learning program; (4) implementing the learning program; and (5) evaluating results. The following programs are profiled: Adalet-PLM; American Electric Cordsets; American Steel & Wire Corporation; Chrysler Corporation, Toledo Assembly Plant; the City Machine & Wheel Company; Diamonite Products; Ethicon Endo-Surgery, Inc.; General Motors, Inland Fisher Guide Division; General Motors, Powertrain Division; Gibson Greetings, Inc.; Green Manufacturing, Inc.; the Horsburgh & Scott Company; Navistar International, Springfield Body Plant; Northeast Ohio Regional Sewer District; the Toledo Hospital; the University of Cincinnati & University of Cincinnati Hospital; Whirlpool Corporation, Clyde Division; and Whirlpool Corporation, Marion Division. (KC)

MODELS of EXCELLENCE

A Review of Ohio's Award-Winning Workplace Literacy Programs

Alliance for Workforce Excellence
Ohio Bureau of Employment Services

George V. Voinovich, Governor
Debra R. Bowland, Administrator

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June 1994

George V. Voinovich
Governor

Debra R. Bowland
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The information contained in this report has been summarized from nominations for the Ohio Governor's Workforce Excellence Award and is accurate to the extent that the original nominations were accurate and complete. The Office of Workforce Development has made extensive efforts to update this information, particularly concerning the contact person at each organization. However, because of the transient nature of business, the Office of Workforce Development cannot guarantee the accuracy of the contact information after the publication date of this document.

The following Ohio Bureau of Employment Services staff members contributed to the preparation of this document: James Mermis, Robert Marinacci and Kathryn Kildow helped review and abstract the Governor's Workforce Excellence Award nominations, Shannon Gordon and Melanie Kennedy proofread and edited the report, Teddi Lewis provided desktop publishing assistance and Bill Goggins created the cover.

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Introduction

In his book *Head to Head,* Lester Thurow describes how a nation's ability to compete economically with other nations is determined to a great extent by its ability to control the supply and cost of labor and access to technology, natural resources and capital. For most of this century, and certainly since the end of World War II, the U.S. has dominated the world economy because it controlled the world's technol· ,y, natural resources and financial markets. At home, the demand for labo· ,enerally outstripped the available supply, which encouraged the transfer of low skill jobs to other nations so that the American economy could continue to grow. This in turn kept wages relatively high, compared to the rest of the world -- even for millions of low skill jobs. It also enabled the U.S. to build the highest standard of living in the history of the world.

In general, the efforts of other nations to follow America's example has worked to this nation's advantage. The development and industrialization of nations such as Japan, Taiwan, Korea and Germany has provided the U.S. with growing markets for goods and services. However, economic development in the rest of the world also means that the U.S., while still the world's dominant economy, no longer can control the world's technology, natural resources and capit·' -- or even the supply of labor. The low to medium skill labor supply in China, Southeast Asia, Latin America and the former Soviet bloc is so large and eager to work that America no longer can compete for jobs on the basis of wages alone. To continue down this path will lead only to a further erosion of the standard of living to which most Americans are accustomed.

Nations such as Germany, Japan and Korea have proven the value to business and society that is derived from a highly skilled and well-paid workforce. Well-developed work skills and the opportunity to put those skills to work have become the currency that will determine the future economic prosperity of states and nations. The single largest source of competitive advantage the U.S. (and Ohio) can possess today is the education and skills of its workforce. The nation must develop new technologies and industries that need a skilled and flexible workforce. Maintaining or improving the nation's standard of living requires the U.S. to develop high skill, high wage jobs and high skill, high wage workers.

Improving the overall quality of the American workforce, however, requires workers who have access not only to the high level skills training required by a high performance workforce, but also to training in the basic work skills that provide a foundation for the higher level skills. The U.S. Department of Labor Secretary's Commission on Achieving Necessary Skills (SCANS), for example, has described five types of workplace competencies needed by high skill, high wage workers:

1. High performance workers know how to allocate time, money, materials, space and staff.
2. High performance workers can work on teams, teach others, serve customers, lead, negotiate and work well with people from culturally diverse backgrounds.
3. High performance workers can acquire and evaluate data, organize and maintain files, interpret and communicate information and use computers to process information.
4. High performance workers understand social, organizational and technological systems. They can monitor and correct performance and can design or improve systems.
5. High performance workers can select equipment and tools, apply technology to specific tasks and maintain and troubleshoot equipment.

However, the commission also accurately pointed out that achieving these high performance competencies is unlikely for workers unless they first are grounded adequately in "foundation skills" that include:

1. Basic literacy skills such as reading, writing, arithmetic and mathematics, speaking and listening.
2. Basic thinking skills such as the ability to learn, reason, think creatively, make decisions and solve problems.
3. Personal qualities such as individual responsibility, self-esteem, self-management, sociability and integrity.

Since their publication three years ago, the SCANS competencies have been part of Governor George Voinovich's initiative to make Ohio a national leader in workforce development. Under his direction, the Ohio Bureau of Employment Services established the annual Governor's Workplace Literacy Awards (now called the Governor's Workforce Excellence Awards) to:

1. Increase statewide awareness of Ohio's need for a high skill, high wage workforce.
2. Acknowledge Ohio employers who are going the extra mile to improve the skills of their workers.
3. Encourage all Ohio employers to provide the training needed to develop a high skill, high wage workforce.
4. Replicate outstanding workforce development programs in other Ohio organizations.

Although Governor Voinovich's high performance workforce initiative recognizes and values the SCANS high performance competencies, these skills are too varied and industry specific to be the primary focus of a concentrated statewide effort.

Instead, the Governor's Workforce Excellence Awards focus on the basic literacy, thinking and personal skills that every Ohio worker must possess. During the last three years, nearly one hundred public and private employers, representing over 175,000 Ohio workers, have been nominated for the Governor's Workforce Excellence Award. Eighteen organizations, ranging in size from 75 to 16,000 employees and representing both public and private sector employers, have received awards from Governor Voinovich. The eighteen award recipients have developed programs that are recognized as models of excellence in program design that other organizations can replicate. This report summarizes the eighteen programs and synthesizes the best practices of these programs into a generalized model of workforce development that includes five basic components:

1. Developing stakeholder support. Stakeholders are any individuals or groups who have an interest or role in the workforce development program. This can include, but is not limited to, management, supervisors, employees, labor unions, educational service providers, government agencies or community based organizations. The process includes developing an initial awareness of the need for training, identifying the key stakeholders and negotiating for their support and establishing general goals for the program.
2. Assessing workplace skills. The emotional and psychological tension that can exist when an organization's employee literacy or math skills are addressed highlights the absolute need for caution when making decisions about the need to assess job and worker skills. The assessment process includes defining desired program outcomes, developing a needs assessment plan, choosing the most appropriate assessment techniques and ensuring the confidentiality of individual employee data.
3. Designing the learning program. Training in the SCANS foundation skills does not lend itself readily to canned or off-the-shelf programs. Since employees who are pursuing foundation skills training often have a past history of poor educational performance, significant care must be devoted to the overall design of the instructional program and the selection of the most appropriate instructional methods, materials, technologies and curriculum content.
4. Implementing the learning program. Implementation addresses issues such as identifying and obtaining program funding, selecting instructional facilities, marketing the program to employees, selecting employees for training and providing incentives for attendance and performance.
5. Evaluating results. Evaluation addresses the program's ability to achieve its overall goals and specific training objectives, with a focus on the impact of the training on employee attitudes, classroom learning, individual performance and organizational effectiveness.

ADALET-PLM
Cleveland, Ohio

As a member of the Scott Fetzer group of companies, Adalet-PLM has developed an international reputation as a manufacturer of high quality electrical equipment for use in high voltage and hazardous atmosphere industrial environments. The company's 170 employees manufacture cast aluminum alloy electrical fittings, enclosures and components for use in electricity generating power plants and high voltage cable couplers for use in the mining industry. Adalet-PLM received the 1992 Governor's Workplace Literacy Award.

Developing Stakeholder Support

Adalet-PLM's awareness of the need for basic skills training began in 1989 when it recognized that it was filling many high skill, high wage jobs from outside the company. By 1990, a growing need for skilled machine shop workers led the company to establish skill-based testing for all non-entry level jobs. Almost immediately, the company became aware of two developing trends. First, many employees who had bid on new jobs began removing their names from promotion lists rather than take the skill tests. The company also found that many employees who took the tests exhibited poor basic math and machining skills.

After this initial screening identified a need for further action, Adalet-PLM worked with its primary stakeholders to develop a project plan. The stakeholders included senior management, shop supervisors, the Employers Resource Council (a northeast Ohio business advisory group), machine shop employees and the employees' representatives from the International Brotherhood of Electrical Workers, Local 1377. Together, the stakeholders developed three program goals, including:

1. Improving employee skill levels to meet the quality demands of Adalet-PLM's customers.
2. Offering employees the opportunity for professional growth and learning.
3. Helping employees develop the skills they needed to better perform their jobs.

Following a plant-wide assessment and the development of an initial training plan, company management presented the plan to the union representatives. This process helped employees understand the need for training and reassured them that no employees would lose their jobs as a result of the testing. After the union endorsed the plan, management worked with supervisors to prepare training schedules that would allow employees to participate in the training on company

time while minimizing production disruptions. Employee commitment to the training was further enhanced by the company's decision to allow into the classes former employees who currently were unemployed.

Assessing Workplace Skills

Adalet-PLM asked the Employers Resource Council to develop an initial skill assessment that tested the basic math, blueprint reading, general machining and CNC machining skills of forty-five machine shop employees. The assessment scores indicated that training was needed in each of the four components. Access to individual employee data was limited to the Manager of Human Resources and assessment graders from the Employers Resource Council.

When the company realized that even highly skilled machinists exhibited poor math and machining skills, it hired Project: Learn, a Cleveland-area non-profit agency that provides adult literacy instruction, to develop a plant-wide assessment of employee reading, writing and math skills. The agency administered all tests and mailed individual scores to employees' homes. The company received only composite scores and individual scores without names. The assessment revealed a plant-wide need for training in basic math and blueprint reading.

Designing the Learning Program

Every Adalet-PLM employee must be familiar with blueprints and nearly seventy percent of all orders require customized processing. These facts, plus the results from the skill assessments, convinced company management that all employees should participate in training. The company worked with the Employers Resource Council, Project: Learn, shop supervisors and union leaders to create a flexible instructional format that would enable employees to attend training on company time without significantly affecting production. Employees from the assembly and foundry departments followed a four-course sequence that included math, blueprint reading, communications and problem solving. Machine shop employees followed a six-course sequence that included math, blueprint reading, general machining, CNC machining, communications and problem solving.

Math, blueprint reading and communications classes were taught in a traditional classroom setting, with classes meeting once each week in a two hour block. The more advanced courses included both classroom and shop floor training under the supervision of a machining instructor. Students had regular homework assignments and were tested as they completed each section of a course. The company took attendance and required employees to make up missed classes or assignments. The company established a minimum passing score of seventy-five percent for all courses. Any employee who failed a course exam was required to repeat the course.

Implementing the Learning Program

The company used informal meetings, question-and-answer sessions and the company newsletter to describe the changes that were occurring in the company and the industry and to explain the need for employee involvement in the training. In the early stages of the program, the math and blueprint classes were voluntary. Since 1991, it has been mandatory for all hourly employees, although many salaried employees also take the courses.

Although Adalet-PLM experienced economically slow times during the program period, it continued to totally fund the program. The company turned a conference room into a classroom and added teaching materials to the classroom as needed. Classes were open to all employees. The training occurred on company time, with classes normally beginning at shift changes. The company staggered night shift starting times to avoid extra overtime pay charges and occasionally juggled schedules to accommodate shift changes. Although the company tried to minimize production disruptions, the machine shop classes occasionally required the use of shop equipment for four hour periods.

Evaluating Results

On an individual level, most Adalet-PLM employees have successfully completed one or more courses in their respective course sequence. More employees currently are enrolled in formal classes outside the company than at any other time in the company's history. Several employees are enrolled in GED (General Equivalency Diploma) or ABLE (Adult Basic and Literacy Education) classes or in degree-granting programs at local colleges or vocational schools. Many others have requested additional training at the plant site. At the broader organizational level, Adalet-PLM has noticed an increase in quality and productivity since the training began. The training has increased employee awareness of the need for shop floor problem solving, which has helped the company respond better to custom orders. Nearly all of the company's high skill, high wage jobs now are filled by Adalet-PLM employees and the company now posts jobs based on skills and ability rather than seniority.

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AMERICAN ELECTRIC CORDSETS
Apple Creek, Ohio

American Electric Cordsets' 165 Ohio employees manufacture high quality power supply cards for U.S. and international markets. The company recently applied for ISO 9000 certification that will provide an international "preferred supplier" status and a reduced vulnerability to national and international competition. American Electric Cordsets received the 1991 Governor's Workplace Literacy Award and was one of four companies in the nation to receive the U.S. Secretary of Labor's 1992 Labor Investing for Tomorrow (LIFT) Award.

Developing Stakeholder Support

Constantly changing technology and growing customer demands for higher product quality led American Electric Cordsets to the development of plant-wide participatory management teams. When the company surveyed employees to determine what they felt it would take to successfully implement the teams, nearly eighty percent of the employees responded with requests for training that would help them improve their reading, writing, computational and analytical reasoning skills. The company's interest in basic skills training also was driven by the competitive pressures caused by the global economy and a need for higher quality and enhanced manufacturing efficiency.

The relevant project stakeholders included company management and supervisory and production employees. American Electric Cordsets gained early buy-in from employees by asking them to complete self-reports that identified tasks that they found confusing or difficult to perform. The initial phase of the project also included the Ohio State University Agricultural Technical Institute (OSU/ATI) in Wooster, Ohio. OSU/ATI partially funded the training program in return for an opportunity to pilot test the skills training curriculum it had developed.

American Electric Cordsets' primary goal focused on the need for production employees to develop proficiency in work-related reading skills, basic math and measurement techniques, listening skills, decision making abilities and personal responsibility. Long-term project goals also included improved employee morale, improved attendance and greater on-the-job safety.

Assessing Workplace Skills

American Electric Cordsets began its plant-wide skill assessment by first determining the company's short and long term goals. The company then used interviews, observation and discussion groups to identify employee goals and training needs, including specific job tasks that employees found difficult to

perform. Educational technologists from OSU/ATI then conducted interviews with management, supervisors and production employees and videotaped proficient workers to help develop an appropriate needs assessment instrument. This information led to the development of a four part needs assessment that included a standardized reading assessment, customized math inventory, holistically scored writing sample and employee self-report questionnaire.

Designing the Learning Program

The needs assessment and task analysis provided the foundation for developing the company's initial curriculum, which it called the Skill Transfer Enhancement Program (STEP). OSU/ATI developed the curriculum using a functional context approach that tied classroom learning directly to the workplace. The instructional materials were work-based and included actual job materials, paper reports and verbal information about production processes and work problems. The learning programs also integrated basic skills instruction with critical thinking skills to help employees improve their personal levels of responsibility, self-esteem, sociability and self-management.

After studying individual and plant needs assessments, OSU/ATI developed individualized educational plans for all STEP participants. The instructor and individual students jointly developed customized training plans and reached mutual agreement on self-assessment plans and learning objectives. While the initial focus was on reading, writing and computational skills, the competencies covered by the training plans also included allocation of resources, working with others, resolving problems, understanding leadership and supporting diversity.

After completing the first set of STEP sessions, American Electric Cordsets increased its training efforts to meet the specific needs of supervisory personnel. A third set of customized sessions satisfied the requirements for management staff. The company currently is developing STEP II, which will be a continuation of courses for participants who have completed the initial STEP program. Meanwhile, the STEP I program still is available for new participants. American Electric Cordsets also is expanding the STEP program to include its Bensenville, Illinois facility.

Implementing the Learning Program

American Electric Cordsets established a STEP classroom and conference room on the plant site and equipped the rooms with VCRs, projection equipment and dry erase boards, as well as comfortable seating and open working spaces. The Corporate Human Resource Manager served as the on-site coordinator and supervisor of day-to-day operations for the program. OSU/ATI supplied the instructional staff and technical expertise for the program.

All classes met in two hour blocks, twice a week, for ten weeks. Classes met on the employees' own time and were scheduled to accommodate shift changes. To encourage employee commitment to the program, the company paid employees one hour of pay for each two hour class period they attended. Although participation in the STEP program was voluntary and initial expectations were low, nearly forty percent of American Electric Cordsets' employees currently have participated in one or more course sequences.

American Electric Cordsets and OSU / ATI initially shared the costs of the pilot program because of their complementary interests in the program: The company wanted to improve the skills of its employees and the university wanted to demonstrate the effectiveness of its workplace literacy model. While American Electric Cordsets now funds the program entirely, it still uses the expertise and services of OSU / ATI on a regular basis.

Evaluating Results

The evaluation process included training surveys, employee self-reports, job task simulations, mid-course progress evaluations, job task post tests and competency tests. OSU / ATI administered the evaluations to ensure the confidentiality of individual employee data. Only the instructor and individual employees had access to individual data, although OSU / ATI reported composites of training results, without employee names, to American Electric Cordset management.

The university monitored the transfer of learning to the workplace through observation and surveys of employee records, including absentee reports, rejected material logs, scrap reports and personnel safety reports. The company also shared data with the university regarding job performance and advancement. As a result of the STEP program, supervisors currently report that the quality and quantity of work produced has increased and the number of rejected products has decreased. In addition, nearly ninety percent of all employees who participated in the STEP program believe that the training has directly improved their individual work performance.

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AMERICAN STEEL & WIRE CORPORATION
Cuyahoga Heights, Ohio

American Steel & Wire Corporation's 411 employees produce high quality steel rod and wire for the high performance end of the market in the automotive, aerospace, appliance and welding industries. American Steel & Wire received the 1994 Governor's Workforce Excellence Award.

Developing Stakeholder Support

The management of American Steel & Wire attributed its market success to high quality products and a dedication to customer service. This commitment required employees to possess a thorough knowledge of statistical process control (SPC) procedures and reading and math skills strong enough to ensure that operations procedures and process control standards were followed strictly. However, the company's Quality Council, which included the president and executive staff, was concerned that employees did not possess the reading, writing, math, speaking, listening and problem solving skills necessary to help the company maintain its position as the market's quality leader. The council identified instances where employee job performances such as an incorrect application of operating processes or miscalculated SPC procedures indicated deficiencies in reading and math skills.

American Steel & Wire's Quality Council initially contacted local educators, who recommended mandatory testing and training for all employees. However, employees felt threatened by this approach and strongly resisted the company's efforts. The company then formed a Focus Team, made up of managers and employees from each of the company's divisions, to study the issue and report back to the Quality Council. The Focus Team visited several companies that had workplace literacy programs in place and developed benchmarks for establishing a program at American Steel & Wire.

The company's Quality Council accepted the focus team's recommendations and moved forward with plans to implement its skills enhancement training program. It held a series of informational meetings for employees in which it explained the need for a highly skilled workforce and expressed its commitment to help all employees develop the skills the company needed to succeed. Representatives from Townsend Learning Center and Project: Learn, the project partners, also explained that Townsend instructors were nothing like high school teachers and that the learning environment would be adult-oriented and supportive in nature. After employees learned that the skill assessment would be confidential and that management would not have access to individual data, employee anxiety eased. When Project: Learn later conducted the employee assessment, it achieved a voluntary ninety-eight percent participation rate.

Assessing Workplace Skills

American Steel & Wire's Focus Team benchmarked assessment activities at several organizations before recommending Project: Learn as the program's assessment partner. Project: Learn is a Cleveland-area non-profit agency that provides adult literacy instruction. After meeting with American Steel & Wire employees to gain their confidence, Project: Learn conducted a voluntary confidential appraisal of reading, writing and math skills. The assessment was held in the same room for all employees who chose to participate.

Project: Learn held the assessment data in strict confidence. It mailed individual results to each employee's home, but company management received only the range of scores and the overall average scores for reading, writing and math. The average scores also were communicated to all employees so that they could understand that a need existed for company-wide literacy training.

After Project: Learn completed the employee skill assessment, Townsend Learning Center conducted a three month task analysis of every job at American Steel & Wire. The task analysis enabled curriculum designers to determine the reading, writing, math and problem solving skills required for each job. It also provided Townsend Learning Center's instructors with an opportunity to become comfortable with American Steel & Wire's culture and gave employees an opportunity to talk with the instructors who would be teaching the courses.

Designing the Learning Program

Based on the Focus Team's recommendations, American Steel & Wire hired Townsend Learning Center to design and implement the training program. The program initially focused on reading, writing and math instruction for employees with low to intermediate skills. As employee skills increased, the company expanded the program to include higher level reading, writing and math classes, as well as a GED preparation course. The program was built upon a foundation of specially selected adult education materials and supported by work-related materials from American Steel & Wire.

Implementing the Learning Program

American Steel & Wire initially held employee meetings to inform workers about the available courses and encourage their enrollment. Although the company originally used Townsend Learning Center instructors to help market the program, testimonials from employees who had participated in the program later provided an effective method to recruit new candidates. During the meetings, the company stressed the voluntary nature of the program and the guarantee of confidentiality between employee and instructor regarding course progress.

The classes were planned in two hour blocks, twice each week, for ten weeks and scheduled to accommodate the company's rotating shift schedule. Depending on class and individual work schedules, employees either were released from work or paid overtime to attend the training. Managers and supervisors arranged work assignments so that employees could attend classes.

Evaluating Results

Over 150 American Steel & Wire employees have completed at least one course in the program. Data from the first three sessions showed that employee attendance averaged between seventy-five and eighty-five percent, despite the demands of a rotating shift. Pre and post test comparisons indicated that average reading speed increased about one hundred percent and reading comprehension increased between ten and fifteen percent. Average math scores, measured on a one hundred point scale, ranged from twenty-four to fifty-four points higher after completing the training. American Steel & Wire now is preparing for a follow-up company-wide assessment to evaluate overall improvement in employee reading, writing and math skills.

Surveys of managers and supervisors indicated that the training resulted in improved employee job performance and increased product quality, which company management believed led to American Steel & Wire's achievement of "preferred supplier" status for several key customers.

The company also used employee surveys to gather suggestions for improving the training. As a result of the surveys, the company added courses in business writing and GED preparation and redesigned the program from a single ten week session to two separate five week sessions. Employee attitudes also appeared to improve. Despite rotating shift assignments, for example, several employees had perfect attendance records during the training. When the company hosted an on-site education fair, eighty employees attended, with several of these employees later enrolling in college or technical school courses.

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CHRYSLER CORPORATION, TOLEDO ASSEMBLY PLANT
Toledo, Ohio

The Chrysler Corporation, Toledo Assembly Plant assembles four-wheel drive Jeep vehicles and employs nearly 5,000 workers, making it Toledo's largest employer. The Toledo Assembly Plant received the 1991 Governor's Workplace Literacy Award in partnership with UAW Local 12, the University of Toledo Community and Technical College and the Toledo Area Private Industry Council.

Developing Stakeholder Support

The Toledo Assembly Plant has been particularly vulnerable to technological and marketplace changes, with plant employment falling over twenty percent during the last nine years. However, the company has succeeded in stabilizing its current employment by focusing on product and technological changes and worker retraining. The company realized that retraining would be difficult because the average employee age in the plant was approaching forty and many employees lacked a high school diploma. Based on national literacy statistics, the plant management estimated that at least 1,100 employees had serious reading, writing and math skill deficiencies.

The stakeholders at the plant included the Local Joint Training Committee (a UAW/Management advisory committee for training issues), UAW Local 12, the Chrysler-UAW National Training Center, the University of Toledo Community and Technical College and the Toledo Area Private Industry Council.

The Local Joint Training Committee provided the key to stakeholder commitment to the project. The committee had achieved previous success in providing training in personal development, technical and job-related skills, wellness and college-based instruction and knew that many employees did not participate in these courses because they lacked the prerequisite math and literacy skills. However, the committee's past successes gave it the credibility needed to sell the need for workplace literacy training to top management, union leaders and workers. The Joint Training Committee established five general goals for the project, including:

1. Delivering to approximately three hundred employees, instruction that would enhance their skills in reading, writing, math and GED preparation.
2. Providing employees with the prerequisite skills to succeed in job-related training as well as retraining for employment retention and advancement.
3. Creating a climate that fosters a desire for continuous life-long learning.

4. Enriching employees' personal lives through improved self-esteem, confidence, achievement and workplace competence.
5. Increasing employee participation in UAW/Chrysler's tuition assistance program.

Assessing Workplace Skills

The Toledo Assembly Plant's role in skill assessment included employee surveys, small group question-and-answer sessions and worker education history profiles. The University of Toledo's curriculum specialists also conducted a work site literacy audit and a job task analysis that determined the extent to which employees used basic reading, writing and math skills on the job.

The GED pretest also was used as a preliminary screening instrument because employees were not allowed to enter apprentice programs without a GED or high school diploma. Students who scored well on the test were admitted into the GED preparation classes. Students who failed the test were directed to other plant courses that focused on developing basic reading, writing and math skills.

Designing the Learning Program

The Toledo Assembly Plant program was based on the University of Toledo's philosophy of curriculum development and adult education, which included the following instructional principles:

1. Integration of content and skills. The program made instruction meaningful and applied by incorporating job related and adult interest materials into the reading, writing and math courses.
2. Learning to learn. Employees were taught that lifelong learning can bring internal satisfaction and improved job performance and that all employees can learn, no matter what kind of education experiences they have had.
3. Collaborative learning. Collaboration was built into the practice and problem solving sessions as a way to help adult learners feel comfortable and free to communicate their thoughts and feelings.
4. Computer literacy. Group and individual computer learning was used to help workers become more computer literate and accepting of new technology. Computer skill practice also helped internalize learning and aided in the transfer of skills from the classroom to the workplace.
5. Enhanced communication and critical thinking. Every workplace literacy class incorporated reading, writing, oral communication and problem solving activities into the instruction to help reinforce the development of basic skills.

In addition to the formal coursework, the program included a Learning Assistance Center that provided tutoring and academic support services for workers whose reading and writing skills were below a fourth grade level.

Implementing the Learning Program

The Toledo Assembly Plant program was funded by matching $250,000 grants from the Chrysler-UAW National Training Center and the U.S. Department of Education. The Toledo Assembly Plant provided the plant site facilities, including classrooms, equipment and materials, and the University of Toledo served as the educational services provider. The Toledo Area Private Industry Council served as the grant recipient and fiscal agent for the project.

The University of Toledo designed the program in eight-week instructional cycles. Each class was limited to fifteen students and included four hours of classroom instruction each week. The program was voluntary and employees attended on their own time without compensation. Marketing involved bulk mailings to all employees, articles in the plant newspaper and posters at plant communication centers. Employees who had completed courses also made floor visits to discuss the program with other employees.

Evaluating Results

Written and oral evaluations from program participants have helped hone the curriculum and led to the development of algebra and ESL (English as a Second Language) courses. The program originally planned to serve three hundred adult workers, but over seven hundred people currently have enrolled in nearly eighty different classes. Over two hundred employees and their spouses have received tutoring in the Learning Assistance Center.

Nearly 150 employees have passed the GED test and about eighty percent of these employees have taken other continuing educational programs at the plant. The Toledo Assembly Plant reports that participation in its tuition assistance program has improved and that the number of employees eligible for apprenticeship training programs has increased.

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THE CITY MACHINE AND WHEEL COMPANY
Stow, Ohio

The City Machine and Wheel Company is part of The Brenlin Group, a holding company for seventeen U.S. manufacturing companies. City Machine & Wheel's eighty-nine employees manufacture and distribute trailer, lawn and garden, golf cart and industrial wheels for original equipment manufacturers. City Machine & Wheel/The Brenlin Group received the 1991 Governor's Workplace Literacy Award and was one of four companies in the nation to receive the U.S. Secretary of Labor's 1992 Labor Investing for Tomorrow (LIFT) Award.

Developing Stakeholder Support

The management of the Brenlin Group felt that many of its companies could not take advantage of current technology or prepare for future technological changes because employee reading and math skills were too poor. The company knew that it had a motivated workforce, but that employees were not working as efficiently as they could be working. Management was comfortable with employees' level of job specific skills, but believed that every job in each of the Brenlin companies could be better performed if employee reading and skills were improved.

City Machine & Wheel was selected as the site of the first Brenlin Learning Center. The learning center had responsibility for developing and implementing all educational programs for the company other than job-specific training. In addition to the Brenlin Group management's commitment to the program, City Machine & Wheel stakeholders included all management, production and administrative employees and the director of the on-site learning center.

Assessing Workplace Skills

Before establishing the learning center at City Machine & Wheel, the company administered the Test of Adult Basic Education (TABE) to all employees. The results confirmed the need for reading and math instruction and encouraged the Brenlin Group management to move ahead with their plans for top-to-bottom employee training. All employees also took a computer-based reading and math assessment that was criterion-referenced and correlated with the TABE.

Designing the Learning Program

The learning center primarily used a modular computer-based educational program that provided instruction in multiple grade levels of reading and math. The learning center facilitator used the TABE results and the computer-based

math and reading assessment data to develop a personalized computer learning program to meet each employee's specific reading and math skill deficiencies. Employees worked through the programs and were tested at each level of their individual programs. Employees repeated the process until they tested in the top level of the TABE.

As a reward for reaching the top TABE level, employees were allowed to choose from many different job-related courses such as training on typing and basic computer skills and spreadsheet, word processing and computer aided design programs. The employees also had access to computer-based courses in algebra, geometry, social studies and basic science, as well as a computer-based GED preparation course.

Implementing the Learning Program

City Machine & Wheel established the learning center in a trailer that was located on site and designed for computer assisted learning. The work stations originally were part of an open classroom, but now have been converted to individual study cubicles to ensure learner privacy. The Brenlin Group paid for all expenses of the learning center, including the trailer, computers, learning programs and learning center facilitator.

Training was mandatory for all employees from custodian to vice-president, with all training occurring on company time. Attendance at the learning center averaged between one to three hours per week per employee.

The company prepared a video and brochure to help employees understand the need for training and education as a continuing process that would help all workers maximize their potential. Rather than focus on reading and mathematics remediation training, the marketing materials emphasized the value in having all employees find areas of expertise that they could develop. By taking this approach, the Brenlin Group helped defuse some of the emotional issues involved with foundation skills training.

After work hours, the learning center was available at no charge to employees, their families and a sister company in Akron. Some employees and their spouses used the center to prepare for GED exams or "brush up" on basic reading and math skills before entering college. The center also was available throughout the year for the children of employees, kindergarten through college. Children have used the center to improve their math and reading skills and prepare term papers using the center's word processing equipment. The Brenlin Group also ran a summer computer session for the children of employees to help improve their computer skills and reinforce in their parents the importance of education and lifelong learning.

City Machine & Wheel also has used the learning center as a community service activity. The company is located in an industrial center in the Akron area and has made the learning center available for a small operating fee to local businesses that are not part of the Brenlin Group. It also has provided the learning center's services at no charge to an Akron area church and the Akron Child Guidance Center and has run special summer computer courses for children selected from these two organizations.

Evaluating Results

Post-training computer testing and TABE assessment indicated that all City Machine & Wheel employees made gains in reading and math skills, with some employees achieving 2-3 grade level jumps in reading and math scores. Because of the focus on computer-based training, employees also became more computer proficient, which has helped employees significantly improve their on-the-job performance. In addition to improvement in reading and math skills, City Machine & Wheel reported that employees showed a greater acceptance of opportunities to study work-related materials in the learning center. This has helped improve the overall operating efficiency of the company and has helped make the workforce more flexible and adaptable to technological changes that the company is experiencing.

Employee reaction to the learning center has been very positive. In post-training self-reports, employees have stated that they feel proud of their educational accomplishments and that they have more self-confidence when they face job-related problem solving. Many employees have stated that they never thought they could learn to use a computer or develop higher level math skills such as algebra and geometry. The employees have expressed near unanimous agreement that the skill upgrading that has occurred at City Machine & Wheel has helped everyone become more productive, which in the long term will make everyone's job more secure.

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DIAMONITE PRODUCTS
Shreve, Ohio

Diamonite Products is one of the nation's premier manufacturers of technical ceramics. The company's 301 employees provide total manufacturing and application engineering capabilities that make Diamonite Products a pioneer in state-of-the-art ceramic products. The company received the 1994 Governor's Workforce Excellence Award.

Developing Stakeholder Support

Diamonite Products' desire to maintain its competitive edge as the market's technology leader has led it to embrace programs such as statistical process control (SPC), ISO 9000 (an international performance certification system) and synchronous flow manufacturing. The company's senior management knew that integration of programs like these into Diamonite's day-to-day operations required a skilled and well-trained workforce that could transfer skills across jobs quickly and efficiently. However, it also suspected that production employees lacked the basic skills needed to implement high performance work activities. Management's suspicions were fueled by observations such as high error rates on employee time cards, the employees' apparent inability to read and understand blueprints and their difficulties with the implementation of SPC concepts and applications.

Diamonite realized that any attempt to improve basic skills would require the full support of all employees, so it made a commitment to ensure that employees had a voice in developing and implementing the program. The company's support-building activities included conducting focus groups and administering surveys to determine employee attitudes toward training, forming a curriculum steering committee that represented employees at all levels of the company and creating and implementing a publicity campaign to encourage employees to get involved with the program.

Because Diamonite management wanted to gain employees' trust, it spent three months educating employees about the need for training and how it fit with the company's strategic goals and objectives. As employee support grew, the steering committee developed several training goals, including:

1. Improving the productivity, efficiency and cost effectiveness of each Diamonite employee.
2. Enabling Diamonite employees to achieve added job security, enhanced job mobility and greater job satisfaction.
3. Demonstrating a viable model of basic work skills instruction that was replicable in other organizations.

Assessing Workplace Skills

Diamonite Products contracted with the Ohio State University Agricultural Technical Institute (OSU / ATI) to help assess employee skills, develop the curriculum and implement the program. The partners jointly developed a three step assessment process that required:

1. Diamonite's training staff to complete job and task analyses for each job in the company, collect work materials for each job and review the materials to determine the levels of basic skills employees actually needed in their jobs.
2. Diamonite supervisors and managers to identify competent workers in several key jobs. OSU / ATI then videotaped these employees on the job and later interviewed them to determine the level of skills they actually used on the job.
3. OSU / ATI to administer an assessment of employee basic skills that included a standardized reading test, holistically scored writing instrument and customized math test.

The skill assessments were mandatory for salaried employees and voluntary for hourly employees. Salaried and hourly employees were tested separately so that hourly employees would feel no threats to the confidentiality of their test results. Staff from OSU / ATI gave employees their assessment results in sealed envelopes and met with them in one-on-one sessions to discuss the results and develop a learning plan. Diamonite management had no access to individual employee results and received only composite scores of everyone who took the test.

Designing the Learning Program

OSU / ATI totally custom designed the curriculum, using work-related materials, situations and issues from Diamonite to form the foundation for training. The curriculum addressed three training themes:

1. Pathway skills instruction addressed the most basic work skills, such as learning how to learn, controlling stress, managing time, goal setting, blueprint reading, critical thinking, providing written technical instructions, active listening, providing verbal instructions and demonstrating verbal presentation skills.
2. Gateway skills instruction reviewed work-related math skills such as basic statistics, geometry and the use of measuring instruments. It also taught employees how to relate to others at work.
3. Mastery skills instruction focused on learning how to work together as a team to make decisions, solve problems and conduct results-oriented meetings.

Implementing the Learning Program

Diamonite and OSU/ATI shared about sixty-three percent of the program's cost. The rest of the funding came from a U.S. Department of Education National Workplace Literacy demonstration grant competition that ranked the proposal from Diamonite/OSU first among two hundred proposals submitted.

Diamonite developed an intensive marketing and recruitment campaign to introduce the program to employees and the company CEO met with employees in small groups to answer questions and encourage their participation in the program. The training was mandatory for all salaried employees and voluntary for hourly employees, although everyone who wanted to participate was accepted into the program.

All training was held on-site and scheduled to accommodate shift schedules. Classes met in two-hour blocks, twice each week, for ten weeks. OSU/ATI instructors also were available for one hour before and after class for guided practice on an individual basis. Salaried employees attended class on company time. For hourly employees, Diamonite paid one hour's wages for each additional hour that employees spent in class.

Evaluating Results

Diamonite Products currently has assessed over three hundred employees and 172 have completed at least one ten-week session. Supervisor's feedback on the performance of workers who have completed the program reported:

1. Over eighty percent exhibited improved attitudes at work.
2. Nearly seventy percent had improved communication and team-building skills.
3. Nearly sixty percent were better equipped to handle new equipment and skill requirements.
4. Over half the employees produced better quality work.
5. Over thirty percent of the employees had become more productive.
5. Nearly twenty percent had improved work attendance records.

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ETHICON ENDO-SURGERY, INC.
Cincinnati, Ohio

Ethicon Endo-Surgery is a subsidiary of Johnson & Johnson. The company's 1,350 Ohio employees manufacture endoscopic instruments and mechanical surgical wound closure devices. Ethicon Endo-Surgery received the 1991 Governor's Workplace Literacy Award.

Developing Stakeholder Support

Ethicon Endo-Surgery's initial interest in basic skills and workplace literacy grew as the company began implementing a team-based total quality management manufacturing environment. The company believed, and assessments later confirmed, that a successful transformation to high performance manufacturing required a higher level of literacy, thinking and interpersonal skills than most employees currently exhibited. The company also discovered that educational deficiencies served as obstacles that prevented employees from pursuing promotions or currently available technical training.

In addition to the commitment of Ethicon Endo-Surgery's management to skill upgrading, company-wide support for training was generated by a steering committee of employees, supervisors and the company's instructional staff. Other stakeholders who contributed to the program's success included Great Oaks Joint Vocational School, the Greater Cincinnati Literacy Task Force and the Ohio Department of Education.

Assessing Workplace Skills

An audit of company work materials revealed that employees generally needed tenth grade math and reading skills to adequately perform their current job assignments. The growing focus on total quality management principles also indicated an increasing need for employees who could use statistical process control and other math-based quality control procedures. The move toward a team-based environment further indicated a future need for employees with good problem solving, critical thinking and interpersonal communications skills.

Ethicon Endo-Surgery's specific training needs were determined by comparing the current and future skill needs of the company with the skills employees currently possessed. A survey of employee educational history revealed a large percentage of employees who had less than a high school education. Most employees also had little or no recent involvement in formal training activities, particularly in the types of skills the company needed. As the project developed, Great Oaks Vocational School used the Test of Adult Basic Education (TABE) to determine

employee reading and math skills and individual academic counseling to determine employees' current skill levels in problem solving, critical thinking, decision making and interpersonal communications.

Designing the Learning Program

The TABE results and one-on-one counseling sessions were used to develop individual education plans for each employee. The education plans were used to select an individualized course portfolio and establish performance benchmarks that counselors could use to measure individual employee progress through the program. The general program was developed jointly by Ethicon Endo-Surgery and Great Oaks Joint Vocational School and included three components:

1. Basic literacy training in reading and writing. Reading tutors provided employees with individualized one-on-one instruction based on their individual TABE results. Employees whose basic literacy skills were very poor or who had other special training needs were referred to other agencies and local programs for help.
2. Basic educational skills and GED training. Adult basic and literacy education (ABLE) instructors provided work-based individual instruction to help employees overcome basic academic skill deficiencies and prepare for GED certification.
3. Team development. Instruction in this component of the program included group learning activities designed to involve learners in problem solving, critical thinking, group decision making and interpersonal communication.

Implementing the Learning Program

Ethicon Endo-Surgery provided most of the funding for the program, although Great Oaks Joint Vocational School provided some financial support through state and federal education grants. The company renovated its on-site training center to include four classrooms and state-of-the-art audio-visual equipment. Great Oaks provided the course instructors and developed the program learning materials. The Greater Cincinnati Literacy Task Force provided reading tutor training and acted as a resource for new materials and techniques. The Ohio Department of Education's ABLE consultants also provided in-service training for the program instructors.

Mandatory training sessions classes were scheduled during normal working hours for all employees who needed instruction. The classes met in two hour blocks, one day per week, in two separate six week sessions. Individual instruction was scheduled between tutors and employees on an as-needed basis. At the end of the semester, each employee had completed seventy-two hours of instruction,

evenly divided between classroom learning, formal homework assignments and individual tutoring. The semester contained counseling and assessment sessions in addition to the formal class sessions in the following format:

1. Orientation and initial assessment (Week One).
2. Individual academic counseling and developing individual education plans (Week Two).
3. Class session #1 (Weeks Three through Eight).
4. Individual academic counseling, comparing progress to initial benchmarks and updating individual education plans (Week Nine).
5. Class session #2 (Weeks Ten through Fifteen).
6. Individual academic counseling, comparing progress to mid-course benchmarks and updating individual education plans (Week Sixteen).

Evaluating Results

Ethicon Endo-Surgery collected data on employee productivity factors such as error rate, absenteeism, employee turnover and equipment downtime. Great Oaks Joint Vocational School developed an evaluation instrument which supervisors used to provide feedback on the transfer of employee learning to the job. The evaluation established that the program improved employee reading and writing skills an average of 2-3 grade levels. The company also determined that the program helped employees successfully develop skills in computer applications, critical thinking, statistical process control, blueprint reading and geometric tolerancing.

Through the Spring of 1991, nearly 120 employees had participated in Ethicon Endo-Surgery's learning program. Several of these employees have received their GED and currently are pursuing college degrees. The perceptions of most of the employees who participated in the program have been positive. The employees particularly liked the instruction on teamwork and interpersonal communications, which they felt improved their ability to give directions or lead work teams.

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GENERAL MOTORS, INLAND FISHER GUIDE DIVISION
Columbus, Ohio

The Columbus plant of General Motors' Inland Fisher Guide Division supplies components for original equipment manufacturers in the automotive industry. The 1,840 Columbus employees produce door frames and latches, anchor bolts, pull down units, compartment latches and decorative moldings. General Motors, Inland Fisher Guide Division received the 1992 Governor's Workplace Literacy Award in partnership with United Auto Workers Local 969 and the South-Western City School District.

Developing Stakeholder Support

In the late 1980s, General Motors and the United Auto Workers tried to implement a team-oriented total quality management program in the Columbus plant. While conducting training workshops on total quality management principles, it became obvious that many employees lacked the basic reading, writing and computational skills necessary to perform statistical process control, decision making, problem solving and work-related reading assignments.

Plant management and labor leaders initially were slow in their commitment to basic skills training. However, support for the program grew when the Columbus Area Labor Management Committee persuaded the plant manager and the president of the UAW Local that the success of the plant's quality program depended on employees who had strong basic literacy and thinking skills.

The project began as a partnership between General Motors management, UAW Local 969 and the Ohio State University's Center on Education and Training for Employment. After the Initial project ended, General Motors and UAW Local 969 elected to continue the program in partnership with the South-Western City School District.

After agreeing on general goals to provide a supportive learning environment and enable workers to adapt successfully to a changing workplace, General Motors and UAW Local 969 jointly developed three specific project objectives, including:

1. Helping GED students prepare for and pass the GED test.
2. Helping "refresher" students improve their skills in reading comprehension, written expression, math, critical thinking, problem solving, geography and research skills.
3. Providing opportunities for students to use the skills center after work hours to pursue individual educational goals.

Assessing Workplace Skills

The initial awareness of the need for training came from the attempt to implement the plant's total quality management program. As the program developed and individual assessment began, South-Western City School personnel proctored, graded and evaluated pre and post program assessment using the Test of Adult Basic Education (TABE). School personnel then helped employees develop Individual Educational Plans that were based on the TABE results.

The stakeholders were committed to the confidentiality of individual employee data. Any test data provided to General Motors or the UAW were released only as a group profile, showing group scores and individual scores without names. Individual employee test results were kept in locked files away from the plant site and were available only to South-Western City Schools personnel. Company and union officials had no access to these employee records.

Designing the Learning Program

General Motors, the UAW and South-Western City Schools jointly developed a program design that contained two instructional components:

1. The basic skills component offered two programs: A refresher course for high school graduates and a program in basic reading, writing, mathematics and GED preparation for employees who had not graduated from high school. Instructional methods included individual and group instruction, student presentations, cooperative learning activities, peer teaching, small group discussions and individual projects. The courses included instructional videos, computer based instruction, self-checking workbooks, work-related materials, motivational materials and adult interest reading materials.
2. The educational enrichment component of the program included specialized courses such as reading improvement and presentation skills development that employees could pursue on their own time. This component primarily provided individual and small group instruction that enabled employees to work on their own time, although computer-based instruction and instructional videos were available for some courses.

Implementing the Learning Program

General Motors created a 1,700 square foot Lifelong Learning Center at the Inland Fisher Guide plant that included a classroom, breakout room, computer lab, study carrels, offices and a work area. The initial project was funded jointly by General Motors and the U.S. Department of Education through a National Workplace

Literacy Demonstration grant awarded to the Ohio State University's Center on Education and Training for Employment. After the federal funding expired, the UAW Local 969 - Inland Fisher Guide Joint Training Fund began funding the program through South-Western City Schools.

General Motors and the UAW marketed the lifelong learning program to employees through the plant newspaper, plant bulletin boards, fliers, closed circuit television advertisements, posters, announcements at local union meetings and articles in the local media. Interested employees met with teachers from the South-Western City Schools, received an initial skill assessment using the TABE and developed an individual educational plan. Employees who wanted to attend the formal six week sessions were grouped according to ability and placed on a waiting list. However, employees had open access to one-on-one tutoring, small group and academic enrichment sessions on their own time.

Evaluating Results

The lifelong learning center used the TABE as the primary program evaluation instrument. Students in the refresher course exhibited a 1.2 year average gain in reading and math skills over the six week period. Results for the GED class were even more dramatic. Twenty-two of twenty-three students passed the GED test. This ninety-six percent passing rate for the General Motors/UAW program was nearly twice the overall average for Ohio during the same period.

The company also reported that the lowering of basic skills barriers accelerated the number of teams that were using total quality management manufacturing concepts. Although no direct measure of impact on organizational effectiveness has been measured, the company reported that employees seem more willing to learn new ideas and accept the change to team concepts.

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GENERAL MOTORS, POWERTRAIN DIVISION
Toledo, Ohio

General Motors, Powertrain Division's Toledo Transmission Plant manufactures automatic transmissions for rear-wheel drive GM automobiles and light-duty trucks. The plant employs over 4,200 workers, making it one of Toledo's largest employers. General Motors Powertrain, in partnership with United Auto Workers Local 14 and Owens Technical College, received the 1992 Governor's Workplace Literacy Award. It also received the 1992 John C. Hoyt Outstanding Employment and Training Leadership Award from the Toledo Area Private Industry Council.

Developing Stakeholder Support

Economic change and technological evolution in the auto industry convinced General Motors and UAW leaders that education and training had become the keys to global manufacturing excellence. However, it also was apparent that the skills of GM's workers needed improvement. The average age of GM Powertrain employees was 45 and a large number of workers lacked a high school education. Based on state and national literacy statistics, the company estimated that 20 percent of the workforce, or about 900 workers, needed basic skills instruction.

In 1989, General Motors Powertrain and UAW Local 14 entered into an agreement with the Toledo Area Private Industry Council, the Ohio Industrial Training Program and Owens Technical College to establish a full time in-plant educational program. After initial funding for the program ran out, GM Powertrain and UAW Local 14 continued to fund the program on their own in collaboration with Owens Technical College.

General Motors Powertrain and UAW Local 14 shared a commitment to excellence through educational opportunity that was the driving force behind the creation of an on-site educational resource center for employees and their family members. The primary training objective focused on workers who needed help in achieving their GED. This was especially important for General Motors Powertrain workers because a high school diploma or GED was a prerequisite for entry into GM-UAW apprentice programs and several other job retraining programs. Other specific program objectives included:

1. Delivering instruction that would enhance the reading, writing, math and GED preparation skills of about three hundred employees.
2. Providing employees with the prerequisite skills they needed to succeed in job-related training and self-development.
3. Creating a climate that fostered a desire for continuous life-long learning and self-improvement.

4. Enriching employees' personal lives through improved self-esteem, confidence, achievement and workplace competence.
5. Increasing employee participation in the tuition assistance program offered through General Motors and the UAW.

Assessing Workplace Skills

General Motors Powertrain's initial assessment of training needs included a review of employee educational histories and a study of literacy statistics. The company also used employee surveys, small group discussions and a work site literacy audit to determine the types of skills workers needed. Educational specialists from Owens Technical College interviewed employees and assessed employee skills. This information was used to develop individual educational programs and determine in which program components employees should enroll.

Designing the Learning Program

The General Motors Powertrain program was based on a philosophy of curriculum development derived from Owens Technical College's experience with adult learners. This included:

1. Integration of content and skills. The program made instruction meaningful and useful by incorporating materials related to the types of activities employees experienced every day.
2. Learning to learn. The desire for life-long learning was stimulated by teaching employees that lifelong learning can bring satisfaction and improved job performance.
3. Collaborative learning. Employees were encouraged to interact with their peers and instructor, which helped create an atmosphere of trust and individual acceptance.
4. Computer literacy. The program used individual computer learning to help workers become more computer literate and accepting of new technology. Computer skill practice also helped internalize learning and aided in the transfer of skills to the workplace.
5. Enhanced communication and critical thinking. Every assignment incorporated reading, writing, oral communication and problem solving activities to help reinforce the development of basic skills.

The General Motors Powertrain program included the following components:

1. Adult basic education and General Educational Development. These components concentrated on basic reading, writing and math skills. Instruction included job-related materials and incorporated group and one-on-one instruction.

2. High school completion assistance. This help was available for employees who did not have enough credits to graduate from high school, but wanted to obtain a high school diploma.
3. Educational enrichment and academic advising. These services helped employees choose among educational options that were available at General Motors Powertrain, such as basic skills training, apprentice training and an in-house Associate Degree program.
4. English as a Second Language courses were provided to serve employees who wanted to improve their English language skills.

Implementing the Learning Program

General Motors Powertrain's program initially was funded by a National Workplace Literacy Demonstration grant from the U.S. Department of Education. When initial funding ended, General Motors Powertrain and UAW Local 14 elected to use Local Joint Training funds to continue operation of the program. Owens Technical College served under contract as the educational service provider to the program.

The company marketed the program to employees through posters, the plant newspaper and peer modeling by program participants. Although participation in the program was encouraged by the company and union, participation was voluntary and on the employee's own time.

Evaluating Results

The program began with a target group of three hundred employees, but already has served over seven hundred employees. Twenty-one employees and thirty-one dependents have passed the GED exam. Sixteen employees who participated in the program later successfully passed apprentice screening exams. After six months in operation, the demand for educational services became so great that the company invited Owens Technical College to offer an on-site Associate degree in Technical Studies. Nine employees now have graduated with the Associate degree. One GED recipient, a spouse, also has received an associate degree.

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GIBSON GREETINGS, INC.
Cincinnati, Ohio

Gibson Greetings is the nation's third-largest producer of greeting cards and one of the oldest companies in Ohio. The company's 1,300 employees manufacture and distribute greeting cards, social expression merchandise and related novelty products for domestic, European, Asian and Mexican markets. Gibson Greetings received the 1992 Governor's Workplace Literacy Award.

Developing Stakeholder Support

Gibson Greetings uses the results of a skills competence test as one criterion in qualifying hourly employees for advancement. After several employees failed one or more parts of the test, the employees asked the company to develop a core skills training program to help them improve their work-related literacy skills. Since the request for training came from the hourly workers, their commitment to the program was strong from the beginning.

Senior management also supported the program from the beginning, and three manufacturing supervisors voluntarily teamed up with the training staff to deliver the training. However, several supervisors initially were skeptical of the program, particularly concerning the company's ability to achieve the program objectives and the aptitudes of their fellow supervisors to provide competent instruction. The skeptics were asked to contribute to the program's design and were kept informed about the program as it developed. Once the program began, the supervisors were urged to review the training with their workers. This ultimately resulted in an overwhelming supervisor commitment to the program and their recognition of its value to the company.

As the company began to develop the program, the objectives began to transcend the initial interest in upgrading skill levels to an acceptable standard. The company management also decided to provide a deeper understanding of the company and its promotion system. This led to the development of several specific program objectives, including:

1. Increasing employee understanding of the company and its history, products and promotion system.
2. Improving employee skills in reading, mathematics and mechanical aptitude.
3. Helping employees achieve acceptable grades on the tests used for job advancement.
4. Increasing employee productivity.
5. Improving employees' test taking ability.

Assessing Workplace Skills

The only assessment of skills used for this program was the skills competence test that Gibson Greetings uses as a criterion for job advancement decisions. The need for training was established after several employees failed the test and asked for help in developing their work-related literacy skills.

Designing the Learning Program

Overall responsibility for design of the program belonged to the Gibson Greetings training department, although manufacturing supervisors also contributed to program development. The company developed a video presentation about Gibson Greetings that included a review of the company history since its founding in 1850, an overview of its products and a description of the company job advancement process. All participants began the program by attending and participating in the video presentation.

After completing the company overview, the employees began their respective skill enhancement programs. Each skill program lasted twenty weeks and included lectures, demonstrations and employee participation. Following each class session, employees received independent work assignments to reinforce the classroom materials.

Implementing the Learning Program

Gibson Greetings provided all funding for the program, including facilities, materials and instructor wages. The company also paid employees one hour for every two hours that they spent in class. A conference room in a remote part of the plant was converted into a training room so that employee confidentiality could be maximized, although most employees spoke freely about their participation in the program.

Gibson Greetings began marketing the program by having the company's training staff meet with plant supervisors to explain the program contents and encourage the supervisors to vocally support the program. Employees were introduced to the program through promotional posters that were placed in the plant. Their interest was stimulated by advertising the program without disclosing its contents. The in-plant marketing activity was followed by mailing to all hourly employees informational packets that included details about the program, including the enrollment date and process.

Classes met in one and a half hour blocks, once per week, for twenty weeks. Participation in the program was voluntary, although employees were encouraged to enroll in as many courses as they wanted. Since Gibson Greetings operates on

a three-shift manufacturing schedule, the program was designed to overlap two shift changes so that all employees had an opportunity to participate. This was accomplished by beginning the classes at 6:15 a.m. and 10:15 p.m.

Evaluating Results

Gibson Greetings used three evaluation measures to determine the value and effectiveness of the program:

1. A comparison between each employee's final exam score for each skill area and the score the employee received on the initial skill competence test.
2. A comparison of pre-program and final exam scores, using the same instrument for both tests.
3. A survey of program participants' reactions to the program.

The evaluation data clearly showed dramatic improvements in employee skill levels after completing the program:

1. Participants in the reading program improved their pre/post scores an average of twenty-five percent on a company-developed test that had a higher degree of difficulty than the vocational school's reading comprehension test.
2. Mathematics students achieved an average thirty-eight percent improvement in their pre/post scores. The math test also had a higher degree of difficulty than the vocational school's test.
3. The participants in the mechanical aptitude program improved their pre/post scores by forty-three percent on a test judged to be at the same level of difficulty as the vocational school's test.

The post-program survey of employee reactions to the program was unanimously positive. Employees felt that the program was beneficial from competence and motivational standpoints. Although no data has been obtained, management and employees agreed that the training enabled employees to read job specifications with greater comprehension and make more accurate measurements and calculations, which resulted in higher quality products and reduced scrap.

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GREEN MANUFACTURING, INC.
Bowling Green, Ohio

Green Manufacturing, Inc.'s 128 employees produce custom-designed hydraulic cylinders for original equipment manufacturers in the refuse, construction, towing, agriculture and materials handling industries. The company received the 1994 Governor's Workforce Excellence Award.

Developing Stakeholder Support

In the late 1980s, Green Manufacturing management noticed a lot of wasted time and lost productivity because machine operators had to wait in line for up to half an hour to have the parts they produced checked by an inspector. The company's quality task force decided to redesign the manufacturing process so that machine operators could sign off for their own parts. However, when the company's Quality Assurance supervisor administered to machine operators a written and applied assessment of their inspection skills, only a few people passed the test. Most operators failed the test because of poor reading and math skills.

The company knew that it would lose its competitive edge and ability to expand if did not move quickly to upgrade the basic skills of company employees. This represented a major culture change for some employees, particularly those who were content with their career progress and felt no need to change. Management helped overcome resistance by tying basic skills instruction to the company's gainsharing plan. In meetings with employees, management explained that improvement in basic operational skills were related directly to improved company performance. This would result in greater company profits and a better standard of living for employees. Management reviewed Green Manufacturing's company vision and commitment to provide training to improve employee education and skills. It also explained to employees the general goal of the program: Continued improvement of all employees through job-specific training and continual education in order to maintain a high state of technical competence and provide secure and stable jobs in the community.

Assessing Workplace Skills

After the assessment of inspection skills revealed a widespread lack of reading and math proficiency among employees, Green Manufacturing contracted with Penta Joint Vocational School to provide baseline skills data for everyone in the company. Penta initially administered a math and vocabulary skills locator test to all employees to determine their approximate skill levels. The school then administered the Test of Adult Basic Education (TABE) to determine specific employee math and reading skill levels.

Green Manufacturing also trained its human resource manager to administer a mechanical comprehension assessment and industry-specific math test as a screening tool for all newly hired employees. Although the company also began screening for basic reading skills, it no longer does so because the other skill assessments adequately determine that information.

Designing the Learning Program

Green Manufacturing's educational program was designed primarily by Penta Joint Vocational School, although some courses also were provided by Owens Technical College, Bowling Green State University and the University of Toledo. In addition, skill-specific seminars often were used when individual skill weaknesses were identified during employees' annual performance evaluations.

Implementing the Learning Program

Penta Joint Vocational Schools used grants from the Ohio Department of Education to help cover some of the instructional costs. Additional funding for the educational program was provided primarily by Green Manufacturing, including the cost of instruction provided by commercial training firms and other educational institutions.

All Green Manufacturing employees received training, including top management, middle management, supervisors, the sales, engineering and accounting staffs and production employees. Classes generally were held on-site to make it convenient for employees. Most training and seminars were conducted on company time and were scheduled to accommodate shift changes. Employees who took college classes normally attended after working hours, although work hours occasionally were adjusted to accommodate class schedules.

Employees generally were selected for training based on their work assignments and assessed skill needs. Although the company often used group meetings to make employees aware of training opportunities, supervisors also encouraged employees in one-on-one counseling sessions. The company also scheduled special training sessions during work hours when the employees of entire departments attended training classes together. The company found that peer pressure during these sessions was particularly effective in changing the attitudes of older employees who resisted training efforts.

Evaluating Results

Green Manufacturing used measures of both individual and organizational performance to evaluate the effectiveness of training. Organizational performance was determined by sales volume, market share and overall company productivity,

measured as total sales per employee. Individual performance was measured by using pre and post training measures of employee performance, the number of employees who received their GED and the number of employees who continued to pursue educational opportunities. Using these performance measures, the company reported:

1. Since beginning the gainsharing and education plan in 1986, Green Manufacturing's sales have increased an average of over ten percent each year.
2. During the same time period, the company's share of the hydraulic cylinder market has doubled to nearly ten percent.
3. During this period, overall company productivity has increased fifty-seven percent.
4. Since beginning basic skills training in 1991, overall company productivity has increased over twenty percent.
5. The total number of annual training hours per year has increased from about sixteen hours per employee in 1991 to over 23 hours per employee in 1993.
6. Pre and post training assessments showed skill improvements in all twenty-seven employees who attended the blueprint reading classes.
7. Eight employees successfully improved their basic education levels by completing adult basic education classes and receiving their GED.
8. Ten percent of the workforce currently is taking college classes on their own initiative.
9. Many journeyman machinists have continued taking classes even after completing their four year apprenticeship program.

Green Manufacturing also contracted with the Ross Gainsharing Institute to conduct an annual gainsharing and employee attitude survey. The survey results indicated a six percent overall improvement in employee attitudes and an eleven percent greater trust in management.

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THE HORSBURGH & SCOTT COMPANY
Cleveland, Ohio

The Horsburgh & Scott Company manufactures gears and enclosed drives for heavy industrial applications in the steel, coal, sugar, rubber and plastics industries. The company's 275 employees produce one of a kind gears that range from 3 inches to 28 feet in diameter. The English Speaking Union presented the Horsburgh & Scott Company with its Peace Through English Award to honor the company's efforts to improve the English and literacy skills of its immigrant employees. The Horsburgh & Scott Company also received the 1991 Governor's Workplace Literacy Award.

Developing Stakeholder Support

The Horsburgh & Scott Company traditionally relied on vocational skills programs in the Cleveland area to supply the company with skilled workers. However, many of these programs had ceased to exist by the late 1980s, so the company began to explore the development of its own machinist training program in 1990. Just as the company was about to begin development of the program, it was contacted by Project: Learn, a Cleveland-area non-profit agency that provides adult literacy instruction. The agency had developed an experimental literacy assessment program and wanted to measure the literacy and numeracy skills of Horsburgh & Scott employees. The results of that investigation provided the catalyst for the company to scrap its plans for a machinist training program and concentrate instead on developing the basic literacy skills of its employees.

The key stakeholders for the Horsburgh & Scott program included company management, employees, Project: Learn and the Townsend Learning Center, which provided expertise in curriculum development and implementation. The company's management moved slowly at first to build employee trust in the need for skill assessment and training. Employee trust and commitment grew as the company communicated its core beliefs that every employee had the ability to learn new skills and that poor reading and math skills occurred not because employees were stupid, but because they never had an opportunity to learn the skills in school.

Assessing Workplace Skills

Project: Learn had used funding from an Ohio Department of Education grant to develop an experimental literacy assessment instrument that measured adult reading and math skills. When the agency first approached Horsburgh & Scott, the company was reluctant to participate, fearing a negative reaction by employees. The company ultimately consented to the company-wide assessment

and was shocked by the results. Although the company's workers needed to read complicated blueprints and make careful arithmetic measurements to produce gears that cost many thousands of dollars, the company discovered that fifty percent of its employees could not read beyond the eighth grade level and sixty percent had math skills below a seventh grade level.

Designing the Learning Program

Horsburgh & Scott's management believed that all of their employees had the capacity to contribute beyond their specific job responsibilities, but that they were inhibited by the fear of embarrassment in front of their peers. Although the company initially considered the efficiency and cost advantages of computer-based training, it later decided on a personal approach to learning. The company management felt that employees should be put into an open environment of learning from and with their peers. By going back to basics and slowly encouraging employee interest in self-improvement, the company hoped to stimulate employees to take responsibility for their own learning of job-related technical skills.

Using this open learning environment approach, Horsburgh & Scott worked with Townsend Learning Center to develop a program that fit within the company's strategic continuous improvement plan. The strategic plan, which relied on employee involvement in problem solving, defect reduction and improved customer satisfaction, provided the foundation for a curriculum that included classes in math, basic writing, business writing, English as a Second Language and GED preparation.

Implementing the Learning Program

Horsburgh & Scott contracted with Townsend Learning Center to supply professional adult education teachers for the program. Townsend hired several Cleveland-area teachers who enjoyed teaching adults, could befriend employees and take an interest in their work. This helped create a supportive learning environment and increased employee trust in the program. Implementation of the program was designed around the needs of individual learners so that teachers could respond to the different levels of ability found in each classroom. The program initially began with classes of twelve to fifteen students, but the teachers and students ultimately found groups of six to eight students more comfortable.

Horsburgh & Scott paid for all expenses of the program, including employee salaries. The company wanted employees to understand management's commitment to education and training and felt that employees would be too tired to attend classes in the evening after working all day. Because of this, all classes were held on-site, during working hours, with full pay.

Evaluating Results

After one year of classes, the program has reached over 140 employees and provided nearly 2,300 hours of classroom instruction. The greatest initial interest shown by employees was in the math classes, perhaps because the employees were more comfortable admitting their weaknesses in math than admitting that they could not read or write. However, the math classes helped employees learn that they were not alone in experiencing basic skills deficiencies. This encouraged more openness in the math classes and helped bring about a greater employee willingness to discuss learning weaknesses in other classes as well. This increased level of trust ultimately proved to be a major factor in the program's success.

The improved peer communications that occurred in the classroom also spilled over into the workplace as well. Horsburgh & Scott management noticed an overall increase in morale and a greater trust in management as employees began to understand that they would not be condemned by management for their skill deficiencies. Over one hundred employees now participate in problem solving and brainstorming teams that have helped review and modify manufacturing processes. This has led to measurable decreases in defects and scrap costs, higher profits for the company and greater incentive bonuses to employees under the company's profit sharing plan. Horsburgh & Scott has become convinced that all employees have the ability to learn and contribute to the success of the company. The company is committed to continue providing educational opportunities until all employees have had as much training and education as they need and want.

Employees also began to see significant differences in their personal lives as a result of the training. Horsburgh & Scott reported, for example, about a woman who emigrated to the U.S. over twenty years ago. As a result of the basic math skills she learned in the program, she recently wrote her very first check, after depending on her children to do this for over a dozen years.

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NAVISTAR INTERNATIONAL, SPRINGFIELD BODY PLANT
Springfield, Ohio

The Springfield Body Plant of Navistar International Transportation Corporation is located on the longest continuously occupied manufacturing site in Ohio, with operations dating to 1806. The Springfield Body Plant's 1,246 employees build truck cabs and related parts for world-wide distribution. Navistar International, Springfield Body Plant received the 1994 Governor's Workforce Excellence Award.

Developing Stakeholder Support

The Springfield Body Plant is the oldest manufacturing operation in Navistar International. Faced with low profitability and a history of difficult labor-management relations, many employees feared that the plant soon would close. Plant management realized that the ability of Springfield Body Plant to become profitable and competitive depended on a full-scale investment in employee training. However, many employees had a negative attitude because they did not believe the company was serious about training. To counter this attitude, the plant manager continually challenged employees to grow educationally by joining him in a commitment to plant-wide excellence.

The plant management, employees and union worked together to create a new vision for Springfield Body Plant that included improved safety and employee involvement programs, new production processes to improve productivity and quality, improved management and leadership skills, increased labor-management cooperation and employee participation on cross-departmental teams.

The company conducted a full range of competency and skill needs assessments that resulted in an aggressive, plant-wide training program which ultimately would involve every employee in the plant. Through the planning efforts of several supervisory and labor-management training committees, the Body Plant developed seven objectives for the training initiative, including:

1. Designing a training and development system that supported plant employees in the development of their individual competencies and career aspirations and achievement of their total performance management goals.
2. Reinforcing the Springfield Body Plant's business strategy and objectives for continuous improvement, customer satisfaction and improved profitability.
3. Providing educational and organizational experiences that give employees the opportunity to gain the skills and knowledge to become more competent technologically.

4. Integrating resources and opportunities for managers to develop their leadership abilities as a model of behavior for others to follow.
5. Delivering high quality employee involvement training to improve their problem solving and team building skills.
6. Establishing a system of analysis and consultation that produces cost effective and high quality training design.
7. Providing employees with the educational resources and incentives to become facilitators of their own development.

Assessing Workplace Skills

Springfield Body Plant used five different types of skill assessments, with special precautions taken to guarantee the confidentiality of individual skill assessment data. The five assessments included:

1. Focus interviews. A sample of employees throughout the plant participated in structured interviews to determine training and development needs in different plant operations.
2. Surveys. Written surveys asked employees about their educational background and experiences, individual training needs and personal career goals.
3. Matrix system. Plant management developed a three phase, grid-based training needs assessment that identified plant-wide group skill needs, individual employee training needs and individual total performance management profiles.
4. Customized plant-wide survey. Separate surveys were administered to technical, production and supervisory employees, who defined training and organizational needs in relation to their specific job roles and the courses identified in the interviews and matrix system.
5. Competency-Based Assessment. The assessment examined job roles and functions in detail, provided specific job descriptions and task analyses and produced a targeted training curriculum with specific course goals and objectives.

Designing the Learning Program

Courses were designed to meet the educational levels and interests of employees and were selected so that similar approaches and philosophies were used in all training. The core modules included instruction on management and leadership development, supervisory development, health and safety, technical training, quality development, employee involvement training, business planning and an orientation to Navistar International. The training included formal classes, learning teams, off-site training, benchmarking trips, conferences and workshops, video-based training, on-the-job training, technical labs and computer labs.

Implementing the Learning Program

Springfield Body Plant initially stimulated employee interest in training by presenting the needs assessment results to all employees and explaining why it reflected a need for plant-wide training. The plant also prepared articles for the plant newsletter and a training guide for employees and mailed to all employees a monthly training calendar that included course descriptions and registration materials. Most courses were open to all employees, although a few programs were targeted to specific groups and individuals. Most of the instruction was provided by staff from Clark State Community College and the Joint Labor-Management Training Center at Wright State University. The Body Plant also hired a company to provide private, confidential instruction for employees who wanted to improve their basic literacy skills or achieve their GED.

Although available funding was limited, the Body Plant paid for all training costs, including the building of on-site training rooms. Since the plant could not pay overtime for training, most classes were held on company time, with employees assigned to training time slots that were convenient to their work schedules.

Evaluating Results

Evaluation measures included course feedback instruments, plant performance measures, on-the-job improvement and feedback from the various training committees. The evaluations suggest that the training resulted in sixty-three percent fewer customer complaints, a forty-five percent reduction in scrap and rework, a twenty-one percent reduction in operating costs and a fifty percent reduction in machine set-up time. The Springfield Body Plant also achieved Navistar International's highest quality rating twice in less than three years.

Springfield Body Plant has completed over eight hundred classes during the three years of the program's existence and has provided nearly sixty thousand hours of training to plant employees. Most employees state that the change in leadership styles of managers, supervisors and labor leaders and employees' improved ability to function with better skills has helped the Body Plant adapt to new technology, achieve higher standards of quality and become more productive and profitable.

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NORTHEAST OHIO REGIONAL SEWER DISTRICT
Cleveland, Ohio

Northeast Ohio Regional Sewer District is an independent political subdivision of the State of Ohio that provides wastewater collection and treatment, water quality monitoring and pollution control services for Cleveland and fifty surrounding communities. The Sewer District's 672 employees serve a population of over one million people in an area of nearly three hundred square miles. Northeast Ohio Regional Sewer District received the 1992 Governor's Workplace Literacy Award.

Developing Stakeholder Support

In late 1987, Northeast Ohio Regional Sewer District began an in-house training program to prepare employees to take the State of Ohio Wastewater Treatment Plant Operator certification exam. Although the course was designed for workers who could read at the eighth grade level and process math at the ninth grade level, nearly half the employees dropped out of the program within two weeks because they had difficulty with the training's math and reading requirements.

The Sewer District contacted adult learning specialists at Cuyahoga Community College's Adult Learning Center, who identified employees' poor math and reading skills as obstacles to successful completion of the certification exam. After learning this, the Sewer District established a joint planning and development committee to create a workplace literacy training program for Sewer District employees. The planning committee included adult learning specialists from the Cuyahoga Community College and management and employees from all three of the wastewater treatment plants in the district. The committee established an overall goal to help maintenance and custodial workers compete effectively for promotions by helping them improve their academic and workplace skills. Specific program objectives included:

1. Helping employees who wanted to enroll in the Wastewater Treatment class achieve the necessary competencies in math and reading to successfully enter and complete the course.
2. Helping district employees become more promotable by providing opportunities for them to improve their reading, math and critical thinking skills.

Assessing Workplace Skills

Cuyahoga Community College designed a reading and math skills assessment procedure especially for employees who had dropped out of the certification class. The college then administered the Test of Adult Basic Education (TABE) locator

test to get a rough idea of employee skills. The TABE was followed by the Gates-MacGinitie assessment instrument and the Wide Range Achievement Test (WRAT), with both instruments chosen because they appeared to be more user-friendly and less threatening to employees. Completing the locator and skill assessment procedures took about two hours, including breaks. Results from the assessments showed that nearly every employee who dropped out of the certification class had reading and math skills below the required levels originally established to enter the course.

Sewer District management stressed the confidentiality of individual employee data and took major steps to ensure the privacy of this information. Employee records were locked in cabinets at the College's Adult Learning Center, where the training took place. Sewer District staff had no access to this information. Each student also had a unique computer user code and password and all files and written materials were identified by numbers rather than names.

Designing the Learning Program

Cuyahoga Community College custom designed the workplace education program specifically for Northeast Ohio Regional Sewer District. The self-paced and individualized program integrated computer assisted instruction with one-on-one tutoring. The computer based program included over 3,100 lessons on writing skills, mathematics, reading comprehension, fractions, calculus, geometry, algebra, life skills and the GED test. Over time, the college added other instructional modules, including:

1. A wastewater math review course that included instruction on linear, area, weight and volume conversions and area calculations.
2. Interactive instruction on creative problem solving, thinking skills, workplace mathematics and individual responsibility.
3. Print materials specific to the Sewer District, such as safety and training manuals and review materials for the state wastewater treatment operator certification exam.

Implementing the Learning Program

The initial marketing efforts focused on educating district supervisors and managers about the program and motivating them to encourage employees to participate. The Sewer District followed this by designing informational flyers and posting them in each treatment plant. Cuyahoga Community College also hosted an open house at its Adult Learning Center for designated employees and all district managers, supervisors and foremen. During the open house, Sewer District employees had the opportunity to use the computer equipment, discuss the program, review the instructional materials and meet the college training staff.

The program initially targeted employees of the Operations department who had dropped out of the certification exam review course. After the success of the initial session, the course was opened up to all Sewer District custodial and maintenance employees. Employees registered for the program through their supervisors, who forwarded the names to the district training manager.

Employees attended Cuyahoga Community College's Adult Learning Center in downtown Cleveland because it was located centrally to the three Sewer District plants. Two and a half hour classes were held twice each week for twelve weeks, for a total of sixty training hours per employee. Class size was limited to ten students to maximize the interaction between the employees and the instructor. Employees who attended scheduled classes during their normally scheduled work hours were paid by the Sewer District for their time in class. Employees who attended scheduled classes on their own time were not paid for their time in class. The Sewer District paid for all costs involved with the project.

Evaluating Results

Individual employee progress through the program was measured using the Gates-MacGinitie assessment instrument as a pre and post evaluation. Test results showed that employee reading levels increased an average of one grade level after four hours of instruction and math skills increased one grade level after seven and a half hours of instruction.

Forty-one employees have now completed the program. Nine of thirteen students who had dropped out of the earlier certification review course re-entered the course. Several employees have since become state-certified wastewater treatment plant operators. Two employees who did not have a high school diploma have obtained their GED and several employees have enrolled in college-level courses such as computer science and electronics.

Managers and supervisors also reported that employees who completed the program developed a new sense of self-esteem and individual responsibility. Their improved morale and motivation to learn proved contagious to many other employees who wanted to enroll in the program.

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THE TOLEDO HOSPITAL
Toledo, Ohio

The Toledo Hospital provides primary health care services for the greater Toledo metropolitan area. It employs over 4,500 medical, professional and support workers, making it Toledo's second largest employer. The Toledo Hospital received the 1991 Governor's Workplace Literacy Award.

Developing Stakeholder Support

As part of a general health care industry trend toward reducing costs, improving the quality of health care services and increasing the use of technology, The Toledo Hospital created quality improvement process teams in the late 1980s. The hospital management realized that the success of the teams and the hospital's investment in technology required a workforce skilled in reading, writing and math. However, by late 1990, the hospital realized that many employees lacked these skills. During a series of quality improvement process team meetings, team leaders observed that many team members appeared to have difficulty with reading and spelling skills and were reluctant to take notes, use flipcharts or contribute to team discussions.

The hospital formed a workplace literacy committee to study the extent of the literacy problem at The Toledo Hospital and what it was doing to address the need to improve workers' skills. The committee discovered that a large percentage of hospital employees had reading, writing and math skills far below the skills required by their jobs. It also learned that no process in the hospital existed for identifying or training workers with low skills. This provided the incentive for the hospital to develop and implement a workplace literacy program several months later, with a specific goal to increase employee literacy skills by two grade levels over the course of the program.

Assessing Workplace Skills

The initial identification of a need for workplace literacy training came from the quality improvement process team leaders' observations of team members. The workplace literacy committee then used local, state and national educational and literacy statistics to infer that over sixteen percent of The Toledo Hospital employees had reading, writing and math skills of no more than a sixth grade level. The committee also conducted a literacy analysis of several certification tests, equipment manuals, quality improvement team written materials and other work-related materials. The committee learned that typical work-related materials at the hospital ranged from a tenth to fifteenth grade level in reading, writing and math difficulty.

Owens Technical College administered assessments of employee reading, writing and math skills at the beginning and end of the training sessions, prepared group assessment summaries for hospital administrators and monitored employee records to maintain the confidentiality of employee data. The college also provided GED testing for employees who wanted to pursue high school equivalency certification.

Designing the Learning Program

The Toledo Hospital contracted with Owens Technical College to develop and implement the workplace literacy program. The program focused on reading, writing and math improvement, using general health care and specific job-related materials to make the instruction relevant for employees. The program also provided GED testing on-site to encourage employees to pursue high school equivalency certification after completing the training program.

Implementing the Learning Program

Although The Toledo Hospital pursued funding for the program from private grants and government sources, it initially provided all financial resources for the program, including:

1. The $7,500 cost of one eight-week program, which covered the costs of an on-site instructor, all class supplies, books, pre and post testing, graduation certificates and a graduation ceremony.
2. Classroom space. All classes were held at the hospital. Employee family members were also allowed to participate when space was available.
3. Employee release time. The hospital granted one hour of paid hospital time for each hour of voluntary time each employee contributed to the program.
4. Secretarial support from the hospital's quality and educational resources department.
5. Hospital staff time to develop and implement the program.

The program included a two-hour class, once each week for eight weeks, for a total of sixteen hours. Instructors from Owens Technical College scheduled classes to coincide with shift changes, with one group of employees meeting from 6:30 to 8:30 a.m. and the other group meeting from 2:30 to 4:30 p.m.

The program was offered free of charge to all hospital employees. Since the need for workplace literacy training was not great among the hospital professional staff, marketing efforts were directed at those employees most in need of the training, including dietary workers, environmental service employees, nursing assistants,

laundry workers, lab technicians, cashiers, counselors and telecommunications employees. Although marketing for the program included departmental meetings, the employee newsletter, employee cafeteria displays and quality improvement team meetings, employees primarily were recruited for training through one-on-one meetings with their supervisors.

Evaluating Results

Although The Toledo Hospital did not attempt to evaluate the program's impact on employees and the hospital, it expected measurable results over time. Owens Technical College expected a two grade level improvement in reading, writing and math skills, based on other programs it had developed. The Toledo Hospital expected to see increased employee productivity, improved customer satisfaction and a greater employee commitment to the hospital's quality improvement process. It also hoped for decreased levels of hospital accidents and lower levels of employee turnover and absenteeism.

Reaction to the workplace literacy program at The Toledo Hospital has been overwhelmingly positive. Thirty-four employees have now completed the first session. All of the employees reported feelings of improved self-esteem and self-confidence. They expressed gratitude for the opportunity the hospital provided to help them improve themselves. They also praised the convenience of the on-site program, which enabled employees to obtain training that they would not otherwise have pursued. The participants also felt that the program represented an investment by the hospital in them as employees, which helped increase their commitment to The Toledo Hospital.

The program at The Toledo Hospital currently is the only one serving health care workers in the Toledo area. However, the hospital's management feels that its program can serve as a model for the health care industry and has shared program information with other health care facilities in Ohio.

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THE UNIVERSITY OF CINCINNATI AND UNIVERSITY OF CINCINNATI HOSPITAL
Cincinnati, Ohio

The University of Cincinnati and University of Cincinnati Hospital have a combined workforce of 18,000 employees, making them Cincinnati's largest employer. The University of Cincinnati is one of Ohio's leading teaching and research institutions, while University of Cincinnati Hospital is a major medical teaching and research hospital. The organizations jointly received the 1992 Governor's Workplace Literacy Award.

Developing Stakeholder Support

The workplace literacy programs at the University of Cincinnati and University of Cincinnati Hospital evolved differently. The hospital's program began in its housekeeping department and was driven by management, who was concerned about the inability of entry-level employees to read and understand safety information and other work-related materials. When the hospital funded a pilot literacy program, over one hundred employees responded. The university's involvement began when a human resource professional began tutoring a worker who confessed that he could not read. After the student and tutor were honored by the Greater Cincinnati Literacy Network, other employees requested literacy instruction, which led to a grant-funded adult literacy program at the university.

The general goals for the programs included enhancing reading, writing, math, language and critical thinking skills, improving employee productivity and helping employees attain their personal educational goals. The specific objectives included helping employees:

1. Understand work-related written instructions and training materials.
2. Manage math calculations required by their work assignments.
3. Communicate effectively.
4. Participate in problem solving and process improvement activities related to continuous quality improvement.

Key stakeholders in the twin projects included:

1. The university and hospital administration. Hospital administration provided funding for its pilot program while the university program began as a grant-funded pilot program. The success of both pilots led to continued top management support. Both programs now have secured funding as university budget line items.

2. The American Federation of State, County and Municipal Employees. The union, which represented targeted employees on both campuses, gave its blessing from the beginning of the projects.
3. Great Oaks Joint Vocational School District provided teachers, materials, tutor training and expertise in curriculum design.
4. The Greater Cincinnati Literacy Network provided materials, student recognition and referrals for specialized services.
5. First-line supervisors. The support of first-line supervisors was crucial to the project's success because they had to cover assignments while the students were in class and provide the communication link between students and teachers or program administrators.

Assessing Workplace Skills

Both programs contracted with Great Oaks Joint Vocational School District to assess worker skills. Great Oaks used the Test of Adult Basic Education (TABE) to conduct pre and post instruction assessment of employee reading, math and language skills. The diagnostic profile developed from the test results was used to develop individual learning plans, which determined each employee's starting point in the program.

University and hospital management took great care to ensure the confidentiality of employee data. Great Oaks administered the skill assessments and provided individual data to the course instructors. Individual assessment scores were released to program administrators only if employees specifically allowed it. Supervisors were allowed to see general information about student progress but were denied access to specific assessment data. The need for confidentiality when meeting with employees also was emphasized during the mandatory training Great Oaks provided for all tutors.

Designing the Learning Program

Both programs involved traditional adult basic literacy skills development that included academic classes and individual tutoring. After employees and instructors met one-on-one to develop individual learning plans, the employees attended academic classes, practiced their skills in a reading lab and received individual tutoring. The hospital-based program also used job-specific materials such as work instructions, safety documents and work-related forms.

Implementing the Learning Program

Although both programs were open to all employees, most participants were lower-level hourly employees. Both programs attracted housekeepers, unskilled maintenance workers, groundskeepers and parking attendants. The hospital's

program also included food service workers, cooks, tray-passers, patient transporters, laundry workers, storekeepers and delivery workers. As word of the program spread, the program also began to attract entry-level clerical workers.

The University of Cincinnati marketed its program primarily in special mailings to university employees that included applications and descriptive materials about the program. The hospital focused more heavily on flyers, posters, presentations at staff meetings and direct requests for management participation in promoting the program. Students also provided excellent marketing for the programs through word of mouth advertising.

The university supplied full funding for both programs, although Great Oaks and the Greater Cincinnati Literacy Network also donated services to the programs. Full-time employees attended classes on their work time, with classes offered at shift changes to maximize accessibility. All academic classes, supplemental tutoring activities and GED testing occurred on-site.

Evaluating Results

Post-training assessment of reading, language and math skills showed an average improvement of one and a half to two grade levels. Since the two programs began, over 250 employees have received literacy skills training. Thirty-five students have earned their GED and thirteen of these graduates now are involved in college-level instruction. Eight students also have received job promotions.

In addition to the specific academic achievements of employees, surveys of supervisors reported increased employee self-confidence and improved communication skills, which has increased the willingness of employees to participate in team problem solving efforts and quality improvement efforts.

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WHIRLPOOL CORPORATION, CLYDE DIVISION
Clyde, Ohio

Whirlpool Corporation, Clyde Division employs 3,200 people and is the world's largest manufacturer and marketer of automatic washing machines. The Clyde Division received the 1994 Governor's Workforce Excellence Award.

Developing Stakeholder Support

Continuous product and process improvement have characterized Whirlpool Corporation, Clyde Division since 1987, when the division began developing and implementing a new factory master plan. The master plan, which would transform Clyde Division into a world class manufacturing facility, called for changes from traditional manufacturing processes to cellular manufacturing, quick response manufacturing, total quality management and world-wide excellence.

The manufacturing plan also called for the creation of self-directed work teams, but when the division began implementing the teams, it discovered that many employees lacked the basic reading, math and computer skills to make the teams succeed. The division hired a local vocational school to assess the skills of a sample group of Clyde Division employees. The assessment confirmed that many employees had reading and math skills inadequate for current and future job responsibilities. A pilot training program that followed indicated strong employee support for basic skills training if the classes were convenient and met their specific needs. This led the division to establish the Center for Lifelong Learning and provide it with four major goals:

1. Providing quality basic education to adults who had not completed high school or who completed high school but functioned at less than a high school graduate level.
2. Providing quality instruction for eligible adults to help them reach their educational goals such as a GED or college education.
3. Increasing the number of Clyde Division employees who experience educational and economic achievements as a result of their participation in Lifelong Learning activities.
4. Increasing employee self-esteem and educational level, company productivity and community awareness of the value of education.

Assessing Workplace Skills

After identifying employee basic skill deficiencies while implementing its factory master plan, Clyde Division contracted with Vanguard-Sentinel Joint Vocational School to assess the basic skills of a target group of division employees.

Vanguard-Sentinel selected three hundred employees from one production line, including both salaried and hourly workers, and administered to them the Test of Adult Basic Education (TABE). The skill assessment revealed that over thirty-five percent of the sample group had math skills below the eighth grade level and over thirteen percent had reading skills below the eighth grade level. A review of employee records also suggested that over thirty percent of the division's employees did not have a high school diploma.

Clyde Division's Center for Lifelong Learning later assumed responsibility for employee assessment and began administering the TABE to employees who came to the Center for assistance. All individual scores were kept in locked files available only to the administrator of the Center for Lifelong Learning. Division management received summaries of Center activities, but had no access to employee data.

Designing the Learning Program

The Center for Lifelong Learning was based on a philosophy that adults are able to learn and willingly accept responsibility for their own learning if they receive appropriate coaching and encouragement. The Center's staff also believed that it was not necessary to tie all training directly to the workplace, so some instruction was based on personal, family and community issues as well.

The Center used the TABE and one-on-one interviews to help employees develop individual learning prescriptions that addressed their reading, writing and math skill needs. The available instruction ranged in difficulty from second grade to freshman college. However, if an employee's reading skills were less than a seventh grade level, the learning prescription focused first on reading, with writing and math added after the employee gained confidence in his/her reading skills. Depending on an employee's needs and work schedule, instruction could include all or part of the following: Formal classes, one-on-one tutoring, computer assisted instruction, home study, tape recordings and custom-designed materials.

Implementing the Learning Program

The pilot assessment and a ten week summer training program was funded by an Ohio Department of Education grant to Vanguard-Sentinel Joint Vocational School. Clyde Division paid for all other costs associated with the program and the Center for Lifelong Learning and now contracts with Vanguard-Sentinel to provide instruction and program management. The company invested in computer hardware and software, all educational materials and day to day expenses of the program. It renovated a building to serve as the Center for Lifelong Learning and has now budgeted additional funds to remodel the center to meet expanding demands for classrooms and computers.

Classes generally were limited to about eight to ten students, although some computer classes were limited to as few as five employees. Most classes were taught by employees who volunteered their services before and after work. One group of volunteers committed themselves to two hours of formal instruction, twice each week for five weeks. During the formal classes, the volunteers taught math, reading and basic computer skills. A second group of volunteers served as one-on-one tutors in reading and math.

Clyde Division marketed the program to employees primarily though the plant's daily newspaper, which recognized program participants and encouraged employees to sign up. The newspaper also included a weekly update on learning center activities and personal articles about each GED graduate. Supervisors encouraged employees to participate in the program and publicly acknowledged learner accomplishments. Finally, Clyde Division management hosted an annual recognition brunch for GED graduates and their families. During the brunch, the division vice president presented each graduate with a plaque that recognized his/her educational accomplishments.

Evaluating Results

Since 1992, twenty Clyde Division employees have obtained their GED certificates. At least three of these graduates currently are enrolled in post-secondary education. Thirty-three employees have achieved at least a two grade level jump in reading, math and English and over 180 employees have graduated from the computer literacy class. The computer classes routinely are filled within four hours of open registration and the Learning Center usually has a waiting list for the class.

Over four hundred employees have participated in at least one class at the Center for Lifelong Learning, which now serves about twenty students each day. The student employees and volunteer instructors together have contributed over 3,300 hours in classes at the Center.

To learn more about the award-winning program at Whirlpool Corporation, Clyde Division, contact:

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WHIRLPOOL CORPORATION, MARION DIVISION
Marion, Ohio

Whirlpool Corporation, Marion Division employs 2,100 people and is the world's largest manufacturer of clothes dryers. The Marion Division received the 1994 Governor's Workforce Excellence Award.

Developing Stakeholder Support

Faced with growing challenges caused by technological changes in manufacturing processes and emerging global markets and competitors, Whirlpool Corporation's Marion Division conducted an exhaustive study to identify the driving forces that could transform the division into a world class manufacturing facility. The study identified thirteen principles of world class manufacturing that would drive the divisions's new factory master plan, such as total quality management, computer integrated manufacturing and just-in-time inventory management. The study also identified employee involvement as the number one priority because it was a critical component of the other twelve principles.

Marion Division's management realized that current employees did not have the skills or abilities that would be required to support the technology and work structures of the future and that the division needed an extensive, wide-ranging educational program that would quickly integrate learning and application in the plant. Although Marion Division worked with several local agencies and educational institutions during different phases of the program, it initially formed a strategic alliance with Marion Technical College to assess the division's skill needs, develop and implement the educational plan and monitor it for process improvements. The plan included three general goals:

1. Helping employees understand and apply principles of team dynamics and group problem solving processes.
2. Enabling employees to improve their academic skills, from basic literacy skills to completion of their GED.
3. Providing an opportunity for employees to complete an accredited college degree program that they could use throughout their lives.

Before beginning implementation of the factory master plan, Marion Division operated in a traditional manufacturing environment in which employees often distrusted management motives for change. As part of the process of building support for change, the division developed a twenty-seven hour workshop for all salaried employees to help them understand the future direction of the division and the need for improved and different work skills. The division also presented a shorter version of the workshop for all production employees.

Assessing Workplace Skills

Marion Division did not conduct a plant-wide skill assessment because it could not guarantee the confidentiality of data and was concerned that employees would perceive such an assessment as a test that would expose individual skill deficiencies. Instead of a general skill assessment, the division drew information from computerized hiring records to determine the number of employees without a high school diploma. It also surveyed salaried employees to determine how many of them had pursued education beyond high school graduation.

Teams from the division and Marion Technical College also conducted a DACUM (Designing A Curriculum) analysis of the competencies employees would need in a world class manufacturing environment. The results of this analysis indicated that the skill enhancement needs of current employees ranged from basic literacy skills to the general application of world class manufacturing principles.

Designing the Learning Program

Marion Division and Marion Technical College developed an educational plan that covered the spectrum of identified organizational training needs and enabled employees to progress from basic literacy training to a college degree. The plan included three components:

1. Team training that was designed to provide experiential learning relative to team processes and individual self-discovery. This component included instruction in teambuilding, conflict resolution, group problem solving and dealing with difficult people.
2. GOALS (Growth Opportunities for Adult Learning on Site) training that covered academic skills from basic literacy to GED preparation. The GOALS program also served as a feeder to the degree-granting program at Marion Technical College.
3. A two-year degree in World Class Service and Production from Marion Technical College. The degree program was designed to help students develop the skills needed by manufacturing facilities in the year 2000. The program included courses on all thirteen world class manufacturing principles that Marion Division had identified.

Implementing the Learning Program

In 1993, Marion Division budgeted $1.3 million for its division educational plan, or about $620 per employee. The division also invested over $100 thousand in the construction of on-site classrooms and computer workstations for the convenience of employees. The Ohio Department of Education also provided Marion Technical College with a $15,000 grant to operate the on-site GOALS program for one year.

The team training program was available to all production and management employees. The forty-hour program was taught on-site, on company time, by Whirlpool employees who had completed a train-the-trainer program. The GOALS program was conducted on-site in a strategically located low traffic area to allow employees to participate discreetly. Marion Technical College administered the program to maximize employee confidentiality. All division employees also were eligible for the World Class Service and Production degree program at Marion Technical College. Classes were held on-site and at the college campus. Classes on-site were scheduled to accommodate first and second shift employees, who attended classes on their own time. The college also adapted its administrative processes by conducting on-site course registration, on-site book sales and mass billing to the division, rather than individual billing to employees.

The team training was marketed in departmental meetings and the division's daily newspaper as a strategic change in the way work would be performed in the future. The GOALS program was marketed as a chance for employees to brush up on academic skills. Articles in the daily newspaper included sample problems and questions to generate interest and stimulate conversation among employees. The world class degree program was marketed as an opportunity for every Marion Division employee to receive an all-expenses paid college degree.

Evaluating Results

Nearly twenty percent of Marion Division employees have now completed some type of skill enhancement training. Sixty percent of the employees have completed team training and there now are two hundred functioning teams in the plant. One team has already saved the company $300 thousand in annual packaging costs. Over 140 employees have participated in the GOALS program and twenty-one of these employees have obtained their GED. Over seventy parent-child combinations also participated in a division-sponsored family reading program. The World Class Service and Production degree program has nearly two hundred active students from Marion Division. One class project has generated $40 thousand in annual savings in the plant. Finally, of the twenty-seven core business objectives in the division's performance measurement system, twenty-three have improved since implementation of the educational plan.

To learn about the award-winning program at Whirlpool Corporation, Marion Division, contact:

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