

Technical Note #7

Good thinking:
How CLCI sites are interpreting
curriculum and individual
assessment

*"Collaborative Learning for Continuous
Improvement"*

*New York State Education Department
Workplace Education Project*

*Funded by the National Workplace Literacy Program,
1994-97*

January 1996 edition

Albany
International
(East Greenbush)

2

Albany
International
(Homer)

3

Albany
International
(Menands)

4

Delphi
(Rochester)

5

Eastman Kodak
(Rochester)

6

EG&G Wright
Components
(Phelps)

7

8

**Curriculum and individual assessment
at
Albany International (East Greenbush)**

(as of January 1996)

How the site is interpreting "curriculum"

The needs being addressed

The AI/East Greenbush plant's education planning team (EPT) went through an in-depth workplace needs assessment (WNA) process in spring and summer of 1995 and identified "communications" as a focal point for the CLCI project. The plant is, like many others, struggling with the question of how to continue its shift toward a "quality team" environment, and the EPT saw the CLCI program as a tool for helping the organization to resolve that question.

The process being used to develop the curriculum

The EPT went through an extensive WNA, with site coordinator Margaret Shirk doing many site visits, interviews, focus groups, observations, and reviews of documents. She relied in particular on the input and insights of a human resources manager who had a special interest in what it takes to shift an organization toward a "high performance" mode.

(See Margaret's WNA report -- in the documents at the end of this section -- for details.)

From the WNA, Margaret and the EPT decided to try to address both organizational and individual needs, especially where they "come together." The WNA pointed to "communications" as a broad area of concern. Given that concern, Margaret has begun to develop a "structure" into which learners and others will bring particular topics, issues, and problems to focus on.

To further prepare herself, Margaret called people who have done similar work in the U.S. and Canada, asking for ideas.

The content and formats used in the curriculum

Margaret anticipates that the "content" of the first round of instruction will be a 15-hour introductory ("foundation") course titled "Skills in context: Communication and Knowledge Systems at East Greenbush." Here is Margaret's description of this course:

The objectives of this course focus on developing the following skills and knowledge:

- communication skills for speaking and participating in a variety of situations including problem solving, decision making, future training, and day to day questions and issues.*
- strategies for the organization and oral presentation of information.*
- learning skills specific to individual learning from written directions and manuals (technical reading), oral instructions and presentations in formal learning contexts such as classrooms, meetings, and committees, and on the job training.*

The goal of this course is to develop the skills and strategies needed for employee participation in solving job problems, improving job-specific skills, and planning for future education and training for the continuous improvement of work-related and individual abilities and skills. By focusing on communication and learning skills, this course will provide a context to develop a positive relationship between the human and technical systems that employees participate in here.

This course will develop an understanding of work and education in America, with an explicit emphasis on developing learning skills and communication skills. It will serve as the foundation for all subsequent courses. These skills and knowledge also establish a context for better understanding "the big picture" that shapes the actions and fortunes of individual companies and their employees.

The course will be "problem-posing" in the sense that it will provide a framework within which employees will be able to identify specific issues, concerns, obstacles, and goals around which they want to focus learning activities. Margaret anticipates six different learning groups, all using the same framework but with different specific issues (e.g., communicating with supervisors and co-workers, preparing quarterly reports) unique to each group.

This process of customization (i.e., working out learning goals, etc.) will in itself develop participants' language skills and abilities to identify needs and problems. This course should "fit" the culture of the plant because all employees have gone through TQM training and understand this kind of "lingo."

In addition to focusing on workplace-specific issues, the course will focus on learning and education. It will try to get participants to reflect on school and other prior learning experiences, to put workplace learning in a different light and making their assumptions about learning more explicit.

Margaret also would like participants to write a job description and use it as something to add to and elaborate on over the course of the program. This will help them look at their own work and identify how they use the SCANS skills.

To develop listening and speaking skills, learners might do such things as "communication mapping," identifying how communications and decisions are carried out, obstacles, etc. They might do role plays which they can observe and analyze and in which they can develop various communications skills.

Drawing on her previous experience as a writing instructor (especially for "non-traditional" college students), Margaret wants to set up a class environment in which everyone is expected to speak and write. She will have learners do writing that isn't collected but which gets them into the mode of thinking of themselves as people with something to communicate. These writings can, in turn, be used as notes for further discussion.

This expectation is established as a way of overcoming "the reluctance factor" often found in basic education settings. She feels it is important for the instructor and learners to be clear about the goals they are aiming at in the group.

In addition to "communications," the initial classes will focus on "understanding the big picture" of the contexts (social, economic, political, and educational) in which learners and the organization operate. This will be done through readings taken from daily newspapers, the plant newsletter, the corporate newsletter, and elsewhere. (She feels that the plant newsletter uses language and covers topics of more-direct relevance to most workers than do glossier publications.)

While the above curriculum is still in a fledgling stage, Margaret anticipates that it might eventually be developed into a generic model for an "intro-to-workplace-ed-and-change" course. She is interested in learning from others who have set up similar courses.

How the site is interpreting "individual assessment"

The forms of individual assessment to be used

The planning process is still at an early stage and thus Margaret hasn't yet done much planning of the content and format of individual assessment. She anticipates that, as part of her initial assessment, she will ask participants to informally write up what is going on in the class. This shifts the focus of the assessment from the individual to the class itself.

She might also hold individual meetings with learners to get their input about what they want from the program, as well as obstacles they feel are blocking their learning and development.

Improving how we "do" curriculum and individual assessment

Problems/questions encountered so far

Margaret wonders whether other sites have uncovered "organizational critiques" (i.e., organizational problems which undermine full worker participation in organizational change) and, if so, whether they actually documented those critiques. She also wonders what, if anything, EPTs have done about those organizational obstacles if they have uncovered them.

Sample documents

Document A: "Curriculum Development Notes" prepared by Margaret Shirk, July 7, 1995

Document B: "Workplace Needs Assessment: Skills and Education Needs at Albany International, East Greenbush." Draft prepared by Margaret Shirk and others, summer 1995.

July 7, 1995

Notes toward an introductory course for CLCI.

Paul - These are *my* notes right now. If you see things here that look like good contributions to a piece to submit to the EPT, please mark them off. It's *my* process to write a lot, repeat and make a mess - get it all down - and then, to try to find some good stuff. I like to work this way with someone else too, write back and forth on a text or sit down and write together. I hope this works for you as well.

This initial course intends to provide a basic framework for understanding work and education at East Greenbush. The course addresses 2 fundamental and complementary issues:

1. understanding work in relation to the social, economic and political processes that impact and determine the conditions to which the organization must respond and account to, in a historical as well as contemporary perspective, and
2. understanding education and learning in a historical (traditional) experiential perspective and developing an informed perspective toward adult education and learning at work, for work and life in general.

This knowledge provides an informed perspective for the employees at Albany International to understand the economic and social forces to which the company, and its employees, must respond. Knowledge of this larger context establishes a framework for employees to better understand the company's decision making processes that effect its employees. The grant itself states, "1/2 of the first 40 hour modules will contain common elements for all business partners: how a business makes money, who its competitors are, where it fits in the industry standings, and why continuous improvement positively impacts the quality of work life for the participants." The need for this knowledge was asserted as well in the WNA interviews.

This framework establishes the necessary knowledge base for a workplace education program that can productively address organizational and individual learning needs.

AI (EG)

Doc. A. 1

Learning Objectives for this core course: the what and how of CLCI.

WHAT: Understanding change and education in a high performance workplace, knowledge of the particular workplace situated in the context of economic, social and political relations.

HOW: Explicit emphasis on learning skills and communication skills (establishes the ground for pedagogy in all courses, from passive student model to active learner model).

The common core of knowledge I want to establish in this intro course, centers on work, the common core of experience and knowledge everyone here already shares. I see this as productive ground to work for the development of skills and competencies. It's where we all stand together to begin with, generative in the Freireian sense. This is what Dewey says about this context in Democracy and Education: "An education which acknowledges the full intellectual and social meaning of a vocation would include instruction in the historic background of present conditions, training in science to give intelligence and initiative in dealing with materials and agencies of production; and the study of economics, civics and politics to bring the future worker in touch with the problems of the day and the various methods proposed for its improvement. Above all, it would train powers of readaptation to changing conditions so that future workers would not become blindly subject to a fate imposed on them."

Towards a definition of workplace literacy, descriptive of what I'm trying to do here: workplace literacy - 1. a broad understanding of the whole business and current economic situation, 2. the ability to learn new things, and work with others in a variety of situations (classrooms, on the job, reading, presentations), 3. the confidence to speak up about ideas, make decisions, and communicate in a variety of situations.

AI (EG)
Doc A - 2

The descriptive stuff is the easy part, now the question: how do I make this happen, develop this knowledge, work together in a classroom to make this happen?

I'm text centered, and this focus is mine and therefore probably somewhat problematic. My method would be to supply handouts, probably excerpts I would put together from a variety of texts I'm familiar with. However, I know enough not to start here.

This is how I would start: I would begin with a course outline and spend time going over it and talking about it. My explication of the course really, and the way I talk and present this would be in a tentative way that both asks for and provides rhetorical space and time for questions and comments. Then to set up both the one-to-one communication with me and to initiate response to the course I would ask for everyone to write me an informal letter, ~~or note~~. This presents an immediate question, do I want people to do things out of class, or will I provide time in class for everything? Will I expect reading and writing outside of class, for class, or do it all there?

The letter questions: to provide an introduction to each other in relation to this class. I will write a response to each letter.

1. What would you like to accomplish in this class? In this program? What specific particulars are you interested in that this course/program might deal with?

2. Tell me anything about yourself that you feel comfortable writing, or ask me any questions you might have?

This also provides me with the chance to evaluate individual writing skills, and for the writer to begin the process of self-evaluation, to think about what she/he is doing, wants to do, and to write it out and think about it. To begin to connect and participate in the class.

A1 (EG)
Doc. A. 3

Here are some more questions I think I would use somewhere along the line. These could be "assignments" or the basis or beginning of a class about learning skills.

Describe something you learned to do, and how you learned it?

In school did you ever enjoy learning something? On your own did you ever enjoy learning something?

Describe something you tried to learn by yourself, or in school, or from someone that you had a problem with?

I think these might be interesting questions to ask about the work part of this course, and as I think about this maybe the best logic would be for the learning part of the course to come first. Or, parts of the learning skills stuff could be, and naturally would be anyway, implicit in the way the class is organized, and then they would be explicitly drawn out in the second part of the class? Here are some of my ideas for questions about the work part of the course:

Before you started to work full-time, after completing school, what did you think about work? What did work mean to you, and where and how did you learn that?

I also thought that maybe we could use the SCANS matrix as a text to talk about, to compare with the traditional education we all had, to measure them both against each other.

I know this is more sketch than plan right now but I want you to know where I'm starting from. So, I'll look forward to your comments and contributions. As far as a time frame goes, this stuff makes me really nervous; I can imagine this as a 40 course itself but I know that won't do. Also, there are 4 teams, all working different days and times, and the course has to be offered to everyone. Based on what I've seen in terms of training that's gone on here so far, I think to propose this as an initial ¹²⁰10 hour introductory program that lays the basic foundation that will continue to be developed in all subsequent courses, is what I'm inclined to do.

Doc AI (EG) A. 4

AI (EG)
DOCUMENT B

**WORKPLACE NEEDS ASSESSMENT
SKILLS AND EDUCATION NEEDS
AT ALBANY INTERNATIONAL
EAST GREENBUSH**

prepared by: Margaret W. Shirk
and everyone who talked
with me.

*draft - revisions penciled in. Please feel free to offer
any suggestions for revision, or evaluative comments.*

TABLE OF CONTENTS

I. Introduction	1
II. Findings	2
1. Communication Skills	4
Writing and Reading	6
2. Math Skills	7
3. Computer Skills	8
4. Job Specific Skills	9
III. Evaluation of Prior Training	10
IV. Education Analysis, Recommendations and Goals	13
V. Attachments: WNA Interview Questions	

A1(EG)

Doc. B.

**WORKPLACE NEEDS ASSESSMENT OF SKILLS AND
EDUCATION NEEDS AT ALBANY INTERNATIONAL
EAST GREENBUSH**

I. INTRODUCTION

The ^{collab. learning} Continuous Education for Continuous Improvement Grant (CECI) represents a partnership between the United States Department of Education, the New York State Department of Education, and private industry. East Greenbush is one of three Albany International sites participating in this program. The grant intends to support the development of high performance organizations by providing education programs to develop the learning skills, and knowledge frameworks of the workforce, and to establish an informed basis and model of education and training for the organization.

This report describes the findings of interviews with a total of 84 people at East Greenbush: ~~27~~ salaried employees, 57 hourly employees, and ~~4 office staff~~ employees. The purpose of these interviews was to develop an education program specific to the needs of the organization and the individuals who work here. (a copy of the interview questions is attached to this report) Since continuous training, and the development of employees' skills are fundamental to a high performance workplace, these interviews provided the opportunity to evaluate the organization from an educational framework. This evaluation - Workplace Needs Assessment - focuses on the learning needs at East Greenbush. This assessment identifies problems from an educational vantage point, particularly in the areas of communication skills and practices, existing training strategies, and work processes and procedures.

The WNA format establishes a context for developing an education program in relation to the organization and the people who work here. By beginning with this kind of analysis, and understanding education and training needs in an organizational context, we can establish a direct relationship between the classroom, the organization, specific jobs and responsibilities, and the individuals who work here. This report serves as a foundation from which to develop an education program specific to East Greenbush, and in keeping with the Plan, Do, Study, Act model of a high performance organization.

A1 (EG)
Doc. B

The two primary goals of the program based on the analysis of these interviews are:

1. to make learning a more productive and integrated process in all team relationships and organizational processes and frameworks.

2. for the development of the program to be responsive to the educational needs of employees and the organization, and their on-going assessment of the program.

II. FINDINGS

Overview: The interviews conducted at East Greenbush affirm the fact that a philosophy of building knowledge and process improvement is ingrained in the culture of this organization. These interviews communicate a desire for improvement on both individual and organizational levels; they are seen as necessary complements.

Everyone has bought into the high performance model of the need for process knowledge and communication as essential to the production of a quality product and a quality focused organization. This is evident in the enthusiasm of people here to know more, a rich resource for this education program to build on.

Employees at East Greenbush have repeatedly expressed to me, in groups and in individual interviews, salaried and hourly employees alike, a strong desire to develop an understanding of the principles and knowledge that determine the processes and changes in their work, both at the level of their specific job titles and in the context of the company itself.

The overall evaluation of the need for a workplace education program at East Greenbush is that even though this is a good place to work, and most individuals feel they do a good job, a successful workplace educational program could help East Greenbush to be a better place to work, and if individuals were better trained or educated in relation to their work, they could improve their level of participation in their jobs. It is important to qualify this evaluation with its

*sentences
too long*

*Is this
all they
ask for, or
did you
skew their
responses?*

complement. The organization itself must become a part of this educational process in order to provide for the improved practices and further development of its employees.

None of the following positions is singular or individual. There is a remarkable unanimity and consistency in the ideas and evaluations of the employees at East Greenbush concerning educational needs and issues. People interviewed repeatedly asserted the overall need to see the entire facility as a team, and to think about educational issues in this framework in order to develop an effective program.

Great

Identifying Skills

The skills needed to improve the work of individuals and correspondingly the quality of the organization as a whole, fall into four major categories:

1. communication skills
2. math skills
3. computer skills
4. job specific skills - for particular job requirements and in relation to larger context of the business framework of Albany International

However, it is essential to understanding and defining these skills in relation to East Greenbush and the education program, that these categories are not seen as exclusive of one another. The development of these skills will overlap and enhance each other. The interview responses themselves make clear that this integration is already evident to the workforce here.

Good

This report will describe these skills in the context of the work at East Greenbush, as this context was represented to me by the employee interviews. My recommendations and the program goals will situate the development of these skills in the context of work needs at East Greenbush, but it is important to emphasize that these learning goals more generally aim to develop an educational framework and build knowledge for both work and *"life beyond the mill."*

AI (EG)
Doc. B.

1. COMMUNICATION SKILLS

Communication skills identified as speaking, listening, reading, and writing, in the list of "skills necessary to participate in the East Greenbush Quality Plan" form the backbone of the education program. No matter the subject and content of the course proposed, these skills are the basis for the development of that knowledge.

The need for developing communication skills and contending with organizational communication issues was paramount and unanimous in almost every interview.

Also included in these findings are comments employees have made concerning their needs to have more information and knowledge better communicated to them. These needs range from the communication of consistent information between supervisors and hourly workers, to the presentation of information in quarterly report meetings which everyone attends. Many of these details are discussed in the last section of these findings, which focuses on particular job skills and responsibilities.

Communication is a complex issue both in terms of skills and organizational relations. Repeatedly the need for *"systems to enable and facilitate communication"* has been asserted, as well as the need for individuals to develop these skills. Managers and hourly workers alike emphasize the need for the development of skills and methods for communication for individuals, and the development of systems and methods as communication vehicles for the organization.

Findings such as these are not uncommon in these kinds of assessments and reports. That they are paramount in the findings is reflected in their primary position in this report.

The importance of the relationship between the information necessary for people to do their jobs and a system for communicating this information is best expressed in the following statements. It is important to see the comments represented in this section as both an umbrella for all the findings, as well as the

AI (EG)
Doc. B.

fundamental ingredient for any and all program development. The following are "umbrella" type statements. They will be followed by more specific statements concerning specific communication skill needs - speaking, listening, reading, writing.

"Communication skills have to be the key to everything."

"We need to establish communication vehicles and give the skills to people so they can participate in them."

"There's not a good system established here so people have to make up for that."

"We need to learn about communication and team work for real...in everyday work and life examples."

In one group interview with hourly workers, the question was asked, *"How can we use this program to make us better able to communicate, in order to see our ideas implemented? We all need training in communication and how to make a consensus view."*

A manager speaking about communication needs said, *"We don't allow people to be innovative. When they have good ideas, we don't listen to them."*

And one of the participants from the office staff said this about communication. *"I wonder if we all realize we are each other's internal customers. I hope we don't treat our external customers this way."*

Two more comments that seem to summarize this issue:

"All the interpersonal communication stuff is useful everywhere, how to talk to groups is important here at work and in life."

"Listening, and speaking can help you everywhere. How to listen better, absorb and respond."

AI (EG)
Doc. B

SPECIFICS OF WRITING AND READING AT EAST GREENBUSH

"We need to have better writing skills so we can write in a short, concise manner what we need to say." This view expressed by both managers and hourly employees.

"You know what you want to say in your head, but you can't get it on the page."

In discussing writing situations at work, the format of the trailer card was brought up by three of the four teams. *"The organization of the document itself is part of the problem."* The specifics of this problem focus on the need for more room to write, and standards for the amount of detail and explanation. People said that improving the trailer card would help with production quality and communication between departments. The need for both the structural revision of the document for better interaction with it, and the development of some standards for reporting information which now runs the gamut from *"repaired hole"* to a detailed explanation of the repair.

A frequent issue that came up when discussing writing skills is handwriting. This was described as a problem for hourly workers, office staff, and some managers. *"Handwriting issues are a communication problem here."*

COMMUNICATION SUMMARY: Repeatedly in discussing communication skills, the need was acknowledged in part as an organizational one. The range of analysis was from the general need for a system, a framework and the need to see it work, to a need for each team to have an individual in a leadership position to report to and to know you will get consistent answers from. *"We report to a bunch here,"* was a consistent communication problem asserted by each group, with the acknowledgment that although this isn't something an educational program can fix, talking about communication needs is the context in which to address this issue.

Consistently the *"need for a common language"* was noted by managers and hourly workers alike, and the need to teach people how to talk to each other at all levels here, between levels and between peers and individuals.

A1(EG)
Doc. B.

"I hope that this program can be available to everyone, across all levels here, that's the only way it can be effective. We all need to learn a lot about communicating better here."

2. MATH SKILLS

The need for improvement and further development of math skills covers a wide range of contexts here at East Greenbush. Employees' assessment of the need for math skills for effectively working with numbers here indicates a solid and insightful understanding of the limits of their math skills and abilities. In all instances these evaluations were presented in the specific contexts in which numbers and math are used in the execution of specific jobs and responsibilities.

*See
Delphi SAC
curriculum.*

In one hourly focus group an hourly employee responded to talk about metrics, "We say we don't need it, but we're really just shoving it under the rug."

A manager said of math needs, "Math is a biggie, there is much need for conceptual understanding of the way we use numbers here."

This need was further specified in the following comment. *"We just plot dots on charts and hand out formulas. We need to interpret and make sense out of these activities."* Another variation of the desire for more knowledge concerning the conceptual understanding of the math used in plotting production processes. *"Make this a useful activity for us, it seems like filling in the charts is all they want us to know."*

Many people said they would like to understand the math concepts of the quarterly reports. Probing this area I heard people repeatedly express the need for understanding the charts and graphs that are used as the explanatory basis for decisions made and actions taken. This encompasses a larger context than basic numeracy, more of a basic understanding of statistical concepts and the way they are used here. The following two comments, one from an hourly worker and the other from someone in the office staff are representative articulations of this need.

*A1 (EG)
Doc. B.*

"People don't participate or ask questions in these quarterly report meetings, because of a fear of the subject matter. They're intimidated by statistics, and charts and also lacking confidence in themselves in public speaking."

"The office people need to understand the quarterly reports. We need knowledge of the terms and principles to understand the relations these reports and our company are about. A general common knowledge base so these meetings have meaning."

MATH SUMMARY: Most people sense a future need for more math as well as express an existing need for more math for more informed participation in established practices. The need for conceptual understanding of the fundamentals and principles related to charting and graphs for statistical understanding represents an analytic evaluation of responsibilities here, and the need to better understand those responsibilities. This informed view of a need conveys both frustration from a lack of knowledge and motivation to fill the need.

3. COMPUTER SKILLS

There is a unanimous and consistently expressed agreement for more conceptual knowledge and practical application knowledge related to computer use. The need to know more about the programs that run the machines people work on was asserted in every team interview.

See TN 5

"We need to know more than what buttons to push."

"Everyone would participate in computer training."

"They're machines we work with and don't know very much about."

COMPUTER SUMMARY: Everyone from the teams responded enthusiastically to the prospect of computer training here. Many see the need for computer skills in the future of production changes here, and maybe too as a potential communication vehicle. Computer training is also seen as *"the need to fulfill the*

*A(EG)
Doc. B.*

promise of the incentive program." Many people here purchased computers thinking they would be able to participate in the training that was offered. The few who did found the training overall to be very good and would like the opportunity for more. This will be addressed in more detail in the section of this report that focuses on responses to prior training.

4. JOB SPECIFIC SKILLS AND KNOWLEDGE

This category of skills and knowledge addresses a range of relations: the skills and knowledge specific to running a machine and performing the responsibilities of a job title; the knowledge necessary to understand the responsibilities and processes of one's position in the production process in relation to the other aspects of the production process, as well as more knowledge about the design and uses of the felts we produce.

This fits
not
TNS.
This is
where
is it
(

"We need more hard knowledge about what we do."

"We need more and better on the job training. This would help us to know more about our responsibility."

"There's a need to know more about what other areas do. More comprehensive knowledge processes. We don't understand other areas enough to analyze for correction."

"Different terminology in each department isn't known between departments." An example is "fisheye" in weaving doesn't mean anything in finishing.

A1(EG)
Doc. B.

It's consistently asserted that more knowledge and understanding between areas will improve communication and quality.

"You need a high level of understanding to do your job. We need more knowledge about the equipment we work."

"People here need to understand and know what to do when something doesn't happen according to plan."

"Teach us flexibility and how to work things out."

"Operators need more information and knowledge. There's too much reliance on others for judgment calls, and sometimes conflicting information."

JOB KNOWLEDGE SUMMARY: The need for more information, knowledge and training concerning equipment, process and procedure was repeated consistently. Many see this in the context of organizational issues, and problems with the definitions of job titles and responsibilities as well. However, in terms of training and education, many feel there is a strong need for the development of these fundamental work skills here. In general this is summed up by the comment on this issue, *"We want contexts, information and skills in addition to directions and responsibilities."*

III. EVALUATION OF PRIOR TRAINING

The purpose of the education program is to interface with the existing East Greenbush Quality Plan, and develop skills which will contribute to successful participation. Since training is a part of work participation at East Greenbush, lessons learned from these experiences were sought. The WNA questionnaire asked two questions about training experiences.

A1(EG)
Dec B.

"What training/learning experiences at work have you found useful? What has made previous on-site training (technical, safety, quality or other kinds) successful or unsuccessful?"

"What suggestions do you have for making such training easier and more successful for people? Do you have any suggestions about how training could be improved?"

These findings represent constructive evaluation of prior training experiences. They provide an opportunity to learn from best practices and not make the identified mistakes of unsuccessful practices.

There is unanimous agreement that training should be directly related to work, and that work practices should then be responsive to training to provide for follow through of what is being taught.

"Training in the past has been too generalized. We need to tie the process of learning to associations with our jobs."

"We make felts, training needs to integrate with this process."

"Use what we're involved with everyday. For team work training, address the real issues and examples, not fictional games or examples of what others do."

"There's not a lot of carry over from training to our jobs."

Examples provided here were JIT and KANBAN only used briefly and not by all.

An hourly worker said about the need for reality focused training.

"Maybe they're afraid to bring it up, problems here are seen as trouble, rather than as learning opportunities."

"Courses and methods taught don't sink in, either to individuals or the organization. No follow up, not used consistently. the organization doesn't accommodate new methods learned."

AI (EG)
Doc. B.

"The paper industry course was very helpful. Industry awareness was a two way information and knowledge system. This kind of information contributes to our work, Nobody really knows why we make all the different kinds of felts we make, or what the different processes we do to them do."

People consistently commented on the need for training to be about information and knowledge, not just an "attitude thing."

"Maybe if we had more informative team training, the way it is taught to us was as an attitude thing. We should talk about what we do together, the work in common, then the attitude stuff wouldn't have to be the focus. We would have shared knowledge and information. Understanding what we're doing and why would remove alot of the conflicts here."

Many commented on the need for better teaching skills and methods.

"Teaching skills are needed by those who train us, on the floor and in the training room."

"It depends on who's showing you or teaching you something whether you learn it or not."

The issue of time and training was a consistent issue discussed in the interviews. It is unanimously agreed by everyone I spoke with that there isn't enough time for learning in the way training is organized in 8 hour full day "cram sessions."

"They're always trying to put too much in too short a time."

"We need time in training to talk about ideas."

"It's crammed in too fast. New vocabulary, new concepts...time is a major lack."

AI (EG)
Doc. B.

"We need time to go out and try new things and then to come back and ask questions."

Everyone who participated in the computer training found it extremely useful. It was cited consistently as a good example of training, however, the time issue was cited here as well.

PRIOR TRAINING SUMMARY: Training is seen by all employees in a much larger context than the training room courses and on the job training. Most people understand training to be an essential part of process improvement and view any question or problem with the production process as basically a training or learning issue. The need to tie training directly to needs and processes at East Greenbush was a consistent evaluation. My analysis of three previous training programs (Intro to TQA, TQA Revisited, and Process Management) corresponds with these findings. Most salaried employees commented on the need to acknowledge the positive attitudes employees have towards their work and their desire to do it well as a positive contribution people make to their jobs and to the company.

"We don't do enough celebrating and rewarding, incentives for learning and improvement."

"We need to acknowledge people's involvement in work processes day to day, and recognize and reinforce this positively."

IV. EDUCATION ANALYSIS, RECOMMENDATIONS, AND GOALS

This analysis intends to identify the essentials necessary for the success of an educational program. That the development of this program is based on the initial participation of the employees at East Greenbush is seen as a positive beginning. A total of 84 individuals (41% of the 205 employees in the facility) had input into the development of this report. This program is seen by the employees who participated in these interviews as a positive development for the life of the organization and the lives of all employees.

AI (EG)
Doc. B.

Some of the educational needs identified here do not fall into the context of the CECI grant program, such as the consistently articulated need for more on the job training and knowledge about work processes and procedures. However, this analysis and the resources of the educational providers can provide a needed framework for this kind of training by facilitating the development of teaching/learning strategies, communication skills and the development of employees' skills and competencies to participate successfully in this framework. Indeed, this is the intent and purpose of the grant.

Many of the needs identified represent already established practices in need of further development and refinement to better accommodate East Greenbush employees. Consistently the request was made for a more informed context at every level, with more sharing of information and knowledge and better communication. The most often repeated request was for a "balance" to be achieved regarding training in this organization.

The ideas of balance included:

1. ~~a balance between knowledge of the statistical needs of the company and knowledge of the human needs of the company~~
a balance between people need to know more about the statistical activities they participate in & how those statistical concepts are related to their work processes & responsibilities
2. a balance between a focus on production numbers and production process
3. a balance between an educational program and development of human resources, and the context of what we do here making felts
4. a balance between the knowledge of specific job titles and a more global view of the organization and its responsibilities
5. a balance between changes past and present "in order to move forward, to not undo all the good hard work done here already"

6. a balance between communication skills for individuals and a system for communication in the organization and

Reverse order

*A1 (EG)
Doc. B.*

7. a balance between the knowledge necessary for making felts at East Greenbush, and ~~the~~ everyday responsibilities & contexts.

People here would like for training and education to develop cumulatively and incrementally, so that it stays with people and gets to be part of the big picture. This program is seen as an opportunity to get away from a recent trend described by one manager, and repeated in variations by many individuals, "Just do it, you don't have to know it, just do it." Only one individual expressed a contrary view of the need for a bigger common knowledge base, and a preference for "more specialization, not less, if it's not part of your job you don't need to know it." This view stands alone amid many voices asserting the need for "people to know the big picture."

This view was represented by the individuals from the office staff who participated in these interviews as well. Unanimously, they were interested to learn more about the manufacturing process, since many of the projects they work on are directly related to manufacturing. They all thought that understanding the process from design to manufacturing would enhance their knowledge about the work they do and the context of that work.

RECOMMENDATIONS AND GOALS

Scheduling of the courses needs to be responsive to shift rotations and adjustment effects on employees in manufacturing.

The education program needs to be informed and contextualized in relation to long-term organizational needs. What industry-related technological and other changes are anticipated in this plant that will require new skills and knowledge of employees? It is important that this program develop in relation to both the present and future needs of the employees and the company.

In every course the curriculum will emphasize the interdependence of communication and learning skills and the development of new knowledge.

Each course will be developed in relation to the work at East Greenbush with an emphasis as well on developing learning strategies and making

AI (EG)
Doc. B.

Each course will be developed in relation to the work at East Greenbush with an emphasis as well on developing learning strategies and making connections wherever appropriate between the mill and people's lives outside work. This education program should contribute both to the quality of work life and the quality of life in general.

Course development: The following is a brief sketch for an education program at East Greenbush based on these interviews and findings.

1. Understanding change and education in a high performance workplace. This initial course will have an explicit communication skills and learning skills component. (expand?)

2. "Knowing Your Company" (this title suggested in an interview). An overall business relations and technical course - the big picture, explicating who we are, and what we do at East Greenbush. This course would emphasize the math component of the skills program. The trailer card could also serve as a focus for writing skills and problem solving skills. Again, communication skills are implicit in the framework of this course.

3. Development of an on the job program, with education provider serving as learning and communication consultant.

4. Computer course.

A1(EG)
Doc. B.

Questions for Workplace Needs Assessment (WNA)

Salaried Employees

SKILLS NEEDED TO PARTICIPATE IN EAST GREENBUSH QUALITY PLAN:
communication - speaking, listening, writing, reading (technical and general meaning);
problem solving; decision making; negotiating; team work; conflict resolution; clarification
and consensus; use of computers; understanding systems; technical business language
(internal and external customers, suppliers); self-esteem and confidence in abilities;
patience and self-reflection; numeracy - addition, division, fractions, use of charts, reading,
percents, metric conversions.

1. What would you add or delete to the above list?
2. Are these skills necessary for working successfully at East Greenbush?
What are some specific examples of situations in which people regularly use these skills?
3. Are there employees here who need help in those situations?
What are the signs that indicate those needs?
4. Is there a need here for people to brush up on their reading, writing, math and
communication skills?
What are some specific situations where you see these needs?
5. What suggestions do you have for helping people to improve those skills?
6. Have there been any recent changes that stem from or have resulted in any problems
that this program might address?
7. What are the short and long term educational/training needs here at East Greenbush?
What are the barriers and incentives to learning here?

Al (EG)
Doc. B.

Workplace Needs Assessment (WNA) - Interview Questions

Manufacturing Teams and Office Staff

SKILLS NEEDED TO PARTICIPATE IN EAST GREENBUSH QUALITY PLAN:
communication - speaking, listening, writing, reading (technical and general meaning);
technical business language (internal and external customers, suppliers); problem solving;
decision making; negotiating; team work; conflict resolution; clarification and consensus;
understanding systems; self-esteem and confidence in abilities; patience and self-reflection;
use of computers; numeracy - addition, division, fractions, use of charts, reading, percents,
metric conversions.

1. How long have you been at your job?
2. What training programs have you already participated in?
What did you like best?
What did you like least?
3. What would you add or delete to the above list?
4. What reading, writing, math, and communicating do you do on your job?
5. In what situations here do you think that people might want to brush up on their reading, writing, communicating and math skills?
6. What training/learning experiences at work have you found useful? What has made previous on-site training (technical, safety, quality or other kinds) successful or unsuccessful?
7. What suggestions do you have for making such training easier and more successful for people? or Do you have any suggestions about how training could be improved?
8. How do you think that you learn the best, listening to someone speak, watching and doing it yourself, listening and talking to other, reading how to?
9. What new programs focusing on reading, writing, communications, math or computers would you like to see offered here?
10. Given that continual change is the condition of work in America, what would most help workers to deal with that?
11. Are there any specific problems you experience at work that you think can be solved or improved by an educational program?
12. If you could participate in any kind of educational program here at work what would it be? What would be the most useful training for you?

AI (EG)
Doe B

Curriculum and individual assessment
at
Albany International (Homer)

(as of January 1996)

Background about the site

About the company

The Albany International (AI) plant in Homer manufactures the filament used in other AI plants to make the fabric used in papermaking machines. The company has a history of encouraging workers to improve themselves by participating in educational courses -- including courses not necessarily related to their jobs. The company encourages employees to prepare for changing job demands as equipment becomes increasingly sophisticated.

About the education provider

The education provider is Paula Hayes, an experienced adult educator who has worked on other federal- and state-funded workplace education projects. She is employed by the Onondaga-Cortland-Madison BOCES (Board of Cooperative Educational Services) and based at the UAW/Chrysler Region 9 Training Center in nearby Syracuse.

About the education program

Who is served

This education program is aimed primarily at approximately 37 operators of the extrusion machines. These machines use plastics and resins to produce filament which is then woven in other company facilities. The end product is the "felt" fabric used in papermaking machines.

Some other production area workers also participated in the program on a voluntary basis. Many of the participants were eager to participate because they wanted to clarify their skill needs, document their abilities, and further solidify them to prepare for changing job demands.

Timeline of activities to date

During early 1995, Paula worked with management representative Linda Holland to organize an education planning team. The EPT carried out a workplace needs assessment (described below). Based on the WNA, the team spent the summer developing the following curriculum.

How the site is interpreting "curriculum"

The needs being addressed

The WNA (and additional input from Linda) indicated that the company initially wants to focus on helping the extrusion machine operators understand where paperwork fits into the production process and to deal with particular paperwork tasks required in their jobs. The paperwork allows workers to document nonconforming products and problems which lead to defects. The paperwork is a combination of narrative descriptions, checklists, and computations filled out by workers. The company also wants the program to help improve teamwork, communications, and problem solving among workers. The EPT anticipates that additional needs will emerge once instruction around the above objectives gets underway.

The process being used to develop the curriculum

Although a kind of EPT was put in place, most of the actual workplace needs assessment was carried out by Paula and Linda. Paula made many visits -- often during early morning hours -- to the plant and talked with individual workers when they could spare a few minutes on the shop floor. The operators conveyed their concerns to Linda and Paula, identifying the above-described paperwork as a common concern.

Once it was clear that paperwork would be the initial focal point for learning, Linda and another company representative developed a "model portfolio." This was a collection of properly-completed workplace paperwork. From that portfolio, the EPT then developed a criterion sheet describing characteristics/indicators/examples of properly-completed paperwork.

Paula then showed the model portfolio (with criterion sheets) to the production area employees and asked them to collect samples of their own paperwork over a period of several weeks.

She gave written directions for this task as a way of determining whether the participants can follow written instructions.

Over a two-week period, learners gathered samples of their work in working portfolios. This process proved to be a bit tedious, as it required workers to carefully collect, copy, use, and store 14 pieces of paper in their folders. Linda and Paula reviewed the documents to determine whether/how workers perform particular required tasks. (Linda and Paula were the only EPT members to see these documents, to ensure confidentiality.)

This review process was in itself a lot of work -- especially for Linda who was the authority on what constituted properly-completed paperwork. Linda reviewed 14 documents for each of the 30 employees who returned them.

In some cases, the employees demonstrated their "best work" (their strengths) and in some cases they showed the limitations of their current abilities. From these working portfolios, the EPT has identified training needs to focus on in instructional activities.

The resulting information was recorded on a specially-designed chart.

The content and formats used in the curriculum

In the initial round of learning activities, instruction will be a combination of one-to-one tutorials and group workshops. The former will allow Paula to work with individuals to focus on their particular needs and thereby avoid forcing learners to learn things they already know. (The one-to-one format will also allow Paula to fit instruction into the busy schedules of workers.) In general, activities will focus on the above-described paperwork.

As the workers returned their portfolios in late 1995, the EPT quickly took note of particular problems which were apparent in what was turned in. EPT members could do a quick turn-around and respond to those problems with targeted, customized one-to-one instruction carried out in individual conferences. Typically, a learner would be shown a better way of carrying out a paperwork task, the learner would go out and try it on the floor, and then she or he would return to show the instructor how she or he did and to get additional guidance.

Because several workers appeared to be having trouble filling out accident reports, the EPT decided to organize a workshop to help those workers understand how to deal with that common problem.

The portfolio is thus seen as a focal point for learning activities, rather than merely as an "assessment" tool tacked on to instruction). Learners will use materials from their portfolios, revise them, add new ones, and thereby document what they are learning as they go along. This process will help learners to clarify their needs for future learning activities while also documenting in one place -- in a "mastery" portfolio -- what they know. For example, the learners' portfolios can demonstrate their ability to follow directions and make choices. In the process, the instructor will identify who the "experts" are (i.e., those with particular expertise in various areas) and get them to help in the instructional process, as mentors and/or classroom resource persons.

The group workshops will allow learners with common learning needs to work on them together with Paula and Linda.

Paula explains to the learners that collecting items for the portfolio should not be seen as a "test" or threat. She says that, if these assessment activities appear to uncover "gaps" in learners' knowledge, these gaps shouldn't be seen so much as personal flaws as indicators that they weren't given adequate training in the past.

Despite these reassurances, however, a few workers have appeared to be reluctant to return their completed documents.

Paula feels that this mix of one-to-one instruction and short, focused workshops is a departure from more-common workplace education approaches which try to "fit" busy companies and workers to traditional classroom models.

This process will also create an atmosphere for ongoing career development and learning.

Because the site coordinator is still in the early stages of developing activities for the first round of instruction, no further information is available at this time about the content and impact of the curriculum. Paula has, however, been asked by the company to expand her role there to work full-time for three months to organize a number of training courses. The company has even given her an office and computer to use. She feels that this intensive exposure to the company -- and her close work with company representatives -- will allow her to better understand the company and otherwise integrate the basic skills-related activities with other technical training activities.

Paula feels that the company's invitation for her to expand her role there is an indication that the company now feels comfortable

with her and sees the value of investing more of the company's own resources in an integrated education-and-training effort. She feels that this recognition is due to the fact that she spent almost a full year on site getting to know stakeholders and their needs.

She feels that this year has allowed her to develop a process for program development and needs assessment which can be transferrable not only to other training needs at this site but to other sites as well.

How the site is interpreting "individual assessment"

The above description of how portfolios are woven into the instructional process indicates the forms individual assessment is taking so far.

Conclusion

Future editions of this Tech Note will contain updates on the curriculum and individual assessments being developed at the AI/Homer plant, along with sample documents from that site.

**Curriculum and individual assessment
at
Albany International (Menands)**

(as of January 1996)

How the site is interpreting "curriculum"

The needs being addressed

In early 1995, site coordinator Judy Lees worked with the plant's education planning team (EPT) to conduct a workplace needs assessment (WNA). It showed that the plant's workforce is comprised of experienced workers with strong technical skills and a high quality ethic but with insufficient "softer" skills required in a team environment. The WNA thus indicated a need for educational activities which helped employees better work in teams, communicate, and solve problems.

When employees were asked what workplace problem(s) a communications and team problem-solving program might focus on, they indicated that many workers were having trouble understanding the company's financial benefits package. The focus for the first round of instruction thus used the company's insurance and retirement benefits package both to teach reading, writing, math, problem-identification and -solving techniques, and to provide opportunities to practice practice teaming skills such as listening and negotiating.

Put another way, Judy is helping workers develop the skills they need to be problem solvers and process improvers.

The process being used to develop the curriculum

Judy went through a multi-stage process of getting input from the EPT and then learners themselves. This work built on the foundation of the company's Learning Enhancement Program (LEP), which had begun with individual basic skills assessments in late 1993 followed by basic skills classes in 1994. To supplement information gathered and lessons learned during the LEP, the new WNA was constructed around focus groups, individual interviews, and document reviews. This process consisted of (1) a WNA, (2) initial input from a group of learners organized in a "problem solving" course, and (3) subsequent, ongoing input from those learners once the course got underway.

The content and formats used in the curriculum

While the initial round of instruction focused on helping people to use the company's new benefits package, using the package was not itself the end goal of instruction. Rather, learners were to improve their abilities to gather information, manage it, analyze it, and make decisions with it, both as individuals and in a team setting.

These information-processing, planning, and decision-making skills were seen as applicable to many problems/questions workers face on their jobs, and not just to "using the benefits package."

Judy set up each class as a "PIT" (process improvement team) which emulated the teams they work in back on the floor. In a 40-hour course, the PIT examined the problem of "how to get essential pension-related information to interested employees so they can use it." The PIT felt that the company's previous method of merely handing employees a "book" was not enough. As an alternative, the team figured out a way to present the information via a seminar. They implemented the seminar and attracted many employees who came after work hours. As a sign of the positive impact of the course, it is to be repeated twice at employees' request for other employees in the future. Also, at the end of the course when workers were asked to list in their learning logs what they had learned, several stated that they were now far more aware of the benefits package's importance and procedures.

As 1995 drew to a close, Judy had hoped to run another course on "communications" which would involve supervisors and shop-floor workers in the same class. (She has done this before in other contexts.) This is in response to EPT's and workers' claims that listening, persistence, and negotiating need to be worked on. Such a course would, Judy feels, fit well into the guidelines of the CLCI program.

However, planning for future classes (in 1996) has been put on hold because:

1. The company was trying to keep up with increased market demand and was reluctant to allow too many employees to be off the floor for education-related activities.
2. The plant was also offering a math course as part of its ongoing Learning Enhancement Program as 1995 came to an end.

3. An instructor for the third shift had not yet been selected.
4. The project was put on hold until the second year of funding was made accessible to the site.

Improving how we "do" curriculum and individual assessment

Questions to resolve

Judy says that she has questions about how to document the impact of the program on the workplace itself. This is especially difficult because many of the skills being focused on are not easy to quantify. Another problem with measuring impact is the fact that supervisors and others who might be able to give feedback about worker performance are busy with other duties and don't have the time to observe and reflect on subtle changes in worker "communication," "problem-solving," and "decision-making" skills.

Beyond measuring transfer of learning is the question of how to ensure or facilitate such transfer.

Judy also wants to be sure that whatever is measured in assessment activities is in fact what is taught in her courses. In other words, it is not fair to teach one thing and then judge the effectiveness of the course by measuring something else.

"Positive lessons" (good ideas) to share

Judy found that workers showed an increased willingness to struggle with technical reading, mathematics, and problem-solving techniques when activities were constructed around the company's benefits package. "Textbooks" were easy to obtain from the human resources office, and worksheets like those attached (in the sample documents below) were logical outgrowths.

(Note: Judy and the EPT compiled their instructional materials into a workbook. Copies will be made available through the project office at NYSED.)

Sample documents

- A. Outline of course content
- B. Feedback sheet (on which learners analyze particular information found on the job)
- C. Problem solving worksheet related to insurance
- D. Draft description of the project
- E. Student self-assessment sheet

- F. Student assessment sheet (completed by instructor)
- G. Statement of individual and class goals (spring 1995)
- H. Criteria for measuring program impact
- I. Workplace needs assessment report (8/28/95 draft)

APPENDIX A**Albany International**
Menands – Mount Vernon Dryer Fabrics Division**Learning Enhancement**
Process Improvement Team**Table of Contents****Chapter 1 CAREER SKILLS IDENTIFICATION****Developing a Skills Summary:****The 7 Intelligences & The SCANS Competencies****Identifying and advertising present strengths****Planning your personal work goals:****Preparing for the annual ISO Training Review****Ensuring that you'll be considered for new activities****Chapter 2 DECISION MAKING TOOLS****Charts: T-charts, Flow Charts, Force Field Analysis,
Fishbone diagrams, Weighted charts, Pareto charts****Building analytical skills****Building team skills: Listening, speaking, negotiating, persisting****Chapter 3 BUSINESS SYSTEMS AND FINANCIAL CONCEPTS****Analyzing the benefits from your insurance plan****Understanding the insurance and retirement manuals****Who to ask? How? When?****Planning your personal insurance program****Analyzing the benefits from your pension plan****Learning about investment basics****Planning your personal retirement goals**A1(m)
A. i

APPENDIX B

Name: _____ Date: _____

Item: _____

This item is of significance because it shows new information I have gained and can use, and because I believe the information is valuable.

The information I used to create this includes --

Some of the skills I used to create this include --

This information is of value to me because --

Other comments: _____

A1(m)
B i

APPENDIX C

Problem Solving -- Insurance Worksheet

Name: _____

Family deductible

On a family policy, there is a deductible of \$600. One person must accrue \$300.00 in bills, and the rest of the family all together must accumulate \$300 in bills before the family deductible kicks in. The family pays 20% after that.

If a family of five has the following bills for 1995, how much will they have to pay?

	EX.A	EX.B	EX.C	EX.D	EX. E.
John	280	50	50	350	50
Marsha	500	50	50	290	300
Johnnie	200	10,000 300	600	290	600
Paul	50	75	50	290	50
Georgianna	20	110	50	290	50

Example A. \$ _____

Example B. \$ _____

Example C. \$ _____

Example D. \$ _____

Example E. \$ _____

Types of Coverage - What is the difference between Family Deductible and Stop Loss?

Family Deductible is _____

Stop Loss is _____

Please be ready to explain to the class step-by-step how you came to each answer. Be sure you examine the deductibles before you do your computations!

A1 (m)
C1

APPENDIX C (CONT'D)

Physicals

Physicals are not normally covered. You can be reimbursed for one when you submit both the regular paperwork and the Routine Physician's Exam Claim Form. If there are only routine findings (no diagnosis of a problem) and you neglect to complete the Routine Physician's Exam Claim Form, you pay. If your family group has not yet reached its deductible, you pay the whole amount. If you are over your deductible, you pay \$20.00

Joyce has a family policy, and her two active boys easily accumulate medical bills to meet the deductible. She submitted the following bills for herself in 1995. She did not submit the Routine Physician's Exam Claim Form.

Office visit - strep throat --	35.00
Sinus infections - Feb	50.00
Sinus infection - Mar	50.00
Sinus infection - December	50.00
Sprained ankle - x-rays	30.00
Sprained ankle - treatment	45.00
Routine physical exam	145.00
Urinary tract infection	60.00

How much did she have to pay? \$ _____

How much would Joyce have had to pay if she had submitted the Routine Physician's Exam Claim Form? (I'm glad to say that the physical showed no problems with Joyce's health!)

\$ _____

How much money would she have saved by doing this paperwork?

\$ _____

List the steps you used to come to each answer.

- 1.
- 2.
- 3.
- 4.

A1(m)
C2

APPENDIX C (CONT'D)

Problem Solving -- Insurance Worksheet
Pregnancy

Name: _____

John and Priscilla have just discovered they are expecting their first child. Priscilla's mother and her sisters and her aunts have always said that you should not tell anyone until you begin to show. If they're not even going to tell their parents, why should they tell the insurance company? (What's the benefit if they do?)

(Please be ready to tell your classmates on what page you found your answer.)

The Medical Help Line.

When do you use it? _____

What kind of help do you expect? _____

What is the benefit to you? _____

If the second opinion is different from your doctor's, must you follow the other doctor's recommendation? Yes No

Mary's doctor says her husband should have his gall bladder removed. The second doctor recommended diet and exercises. Which advice must Mary follow?

(Please be ready to tell your classmates on what page you found your answer.)

A1(m)
C3



APPENDIX C (cont'd)

Problem Solving -- Insurance Worksheet Name: _____

Emergency Room Visits

What is the difference between an Emergency Room Visit and an Emergency Room Admission? _____

If you want to take full benefit of your insurance coverage, what must you do as soon as possible after an E.R. Admission? _____

What per cent of coverage can you expect if you don't bother to notify Health International? _____

(Please be ready to tell your classmates on what page you found your answer.)

A1(m)

C4

APPENDIX C (CONT'D)

Sample Weighted Chart Here's a chart to assist an elderly relative who is selecting a senior citizen's apartment complex.

Name of complex: _____

Location: _____

Cost:
shelter : _____ heat: _____
one meal: _____ all meals: _____

Stipulations: _____

<u>RATING</u>	<u>0(Very Poor)</u>	<u>10(Excellent)</u>
Location		
To family	0 1 2 3 4 5 6 7 8 9 10	
To activities	0 1 2 3 4 5 6 7 8 9 10	
To groceries, etc.	0 1 2 3 4 5 6 7 8 9 10	
To good hospitals	0 1 2 3 4 5 6 7 8 9 10	
General	0 1 2 3 4 5 6 7 8 9 10	
Cost	0 1 2 3 4 5 6 7 8 9 10	
Heat		
Cost	0 1 2 3 4 5 6 7 8 9 10	
Control	0 1 2 3 4 5 6 7 8 9 10	
Transportation		
To doctor	0 1 2 3 4 5 6 7 8 9 10	
Shopping	0 1 2 3 4 5 6 7 8 9 10	
Bus or taxi line	0 1 2 3 4 5 6 7 8 9 10	
Meals		
Availability	0 1 2 3 4 5 6 7 8 9 10	
Cost	0 1 2 3 4 5 6 7 8 9 10	
Menu	0 1 2 3 4 5 6 7 8 9 10	
Ambiance	0 1 2 3 4 5 6 7 8 9 10	
Size of apartment	0 1 2 3 4 5 6 7 8 9 10	
Activities offered		
Variety	0 1 2 3 4 5 6 7 8 9 10	
Interest	0 1 2 3 4 5 6 7 8 9 10	

Weighted score

Location	_____	Cost	_____
Heat situation	_____	Transportation	_____
Meals	_____	Ambiance	_____
Size of apartment	_____	Activities offered	_____

Other considerations: _____

A1 (M)
C5

APPENDIX C (CONT'D)

Now it's your turn. Today in class we will develop a T-Chart and a Weighted chart for selecting among the insurance plans offered to you by your employer.

First we'll brainstorm all the factors to be considered. Then we'll place them on a chart.

Begin with a clean sheet of paper. Divide it in half top to bottom with a giant T. Write "good" on the right and "bad" on the left.

Insurance Plan: _____

Basic Cost to me: _____

Cost in a good year if routine medical expenses are \$290:

Cost in a bad year if routine medical expenses are \$1,000:

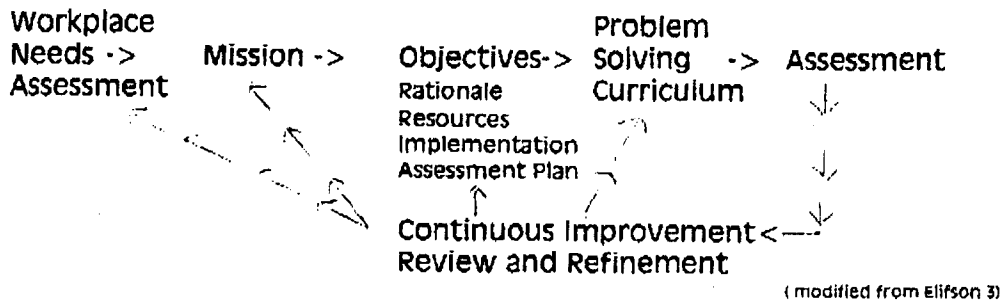
A1 (M)
C6

APPENDIX D

*Paul - Dr in
started but never
finished*

Description of the CEI grant project implemented at the Menands Dryer Fabrics Division of Albany International.

This project is built around a model which is inherently recursive and dynamic. It begins with a thorough analysis of its contexts. It requires a mission and vision understood and shared by all stakeholders. It articulates clear objectives which are then built into a problem solving curriculum, and depends on an assessment plan which informs future courses in a continuous improvement model. Traditionally, courses ended with the assessment results, but here the previous end-point serves as the beginning of a new cycle.



Influenced by Deming and Keller, the strategic planning process involved stakeholders from the plant and from the funders through its committee structure: The Educational Planning Team (EPT) served as liaison between the Albany International stakeholder groups and the education provider, while the Central Planning Team represented the project stakeholders. The project allows a company's education program to be sensitive to subtle changes in context, and to make almost immediate adjustments in programmatic planning.

Contexts for Workplace Needs Analysis/Objectives

As the EPT began to develop its Workplace Needs Analysis (WNA) questions, it was informed by the work of Sue Follinsbee in Canada, and guided by the Strategic notes of Paul Jurmo. The earlier work of the Learning Enhancement Program had provided information about basic skills, thereby allowing the WNA to focus on the broader area of SCANS Competencies. The WNA thus provided perspectives on the multiple contexts for on-site programs, and the EPT was then able to formulate planning assumptions. " A well-executed WNA provides the basis for a realistic analysis that can provide a sturdy framework for the strategic planning process" (Elifson 4).

Planning assumptions generally include expectations about the continuing need for particular courses, the impact of technology advancements, ISO auditors' expectations of employees. Sample Planning assumptions for Menand's Dryer Divisions include the following:

Rationale

Industry-wide uses of increasingly complex technology and ever higher levels of ISO audits will require increased employee basic skills and SCANS competencies. Improvements in technology will allow machines to perform some repetitive tasks presently performed by workers. These workers will need to develop a greater diversity of useful skills through cross-training and education.

Brazenly adapted from Elifson

*AI (m)
DI
J. Lees
Planning for Assessment of Developmental Programs pp 2-4+
Journal of Developmental Ed. - Vol 19, #1, Fall '95*

APPENDIX D (CONT'D)

Resources

AI will continue to support programs to enhance these skills and competencies by providing employee time during workdays, training facilities, textbooks, and contracting for education providers.

Implementation

Courses will be designed by the education provider under advisement by the EPT and federal funders. A course will be initially provided to select first shift employee volunteers, then evaluated for continuous improvement. The Continuous Improvement approach will require attention to teaching effectiveness and worker learning outcomes. This attention will result in continuous refinement of what initially began as the Learning Enhancement Program.

Assessment Plan

The EPT will determine what (papers) should be a part of the worker/student portfolio as indicators of growth. Self-reporting and measurable changes in behaviors as observed by co-workers, supervisors and human resources personnel are also significant sources of assessment.

Contexts for developing the Mission

The Education Provider at the Menands Dryer Division of Albany International, informed by the presentations at the early workshops and with the approval of her Education Planning Team, devised a (four-step) model for participatory strategic planning and assessment. A mission statement was established, planning assumptions were developed from a thorough Workplace Needs Assessment (contextual analysis), then objectives and goals for carrying out the mission were identified, curriculum was developed, and a course was presented. Finally, the results were assessed to achieve program improvement.

As a result of the use of this model, the Steering Committee, Human Resources personnel and trainers, and members of the Education Planning Team all developed a more coherent perspective about the role and purpose of the program within the plant.

The Educational Planning Team played a vital role in developing the division's mission statement, identifying goals, and generating programmatic objectives. The collaboration and cooperation among in-house stake-holders was fostered by contacts established during the preceding Learning Enhancement Project.

These programmatic objectives were then utilized by the education provider to formulate an appropriate Problem Solving Curriculum, which was then approved by the EPT. Thus, curriculum resulted from the complex constellation of parameters established by federal funders and by the many stakeholders surveyed during the WNA.

As reported to the Steering Committee of Menands Dryer Division, the course was designed to:

- * build on people's existing skills and
- * improve their use of work related materials
(such as trailer cards and ISO manuals) and
- * improve their participation in work related activities
(such as committees and project teams).

APPENDIX D (CONT'D)

In addition, the course was designed to increase people's understanding of the communication needs and business processes in the context of the global relations to which the company and its workforce must be responsive. (From 2/14 report to Steering Committee.)

During the latter half of the course, the class functions as a Process Improvement (PI) Team by utilizing the previously taught skills to attack and, ideally, solve the given problem. Their solution is presented to the EPT, then to the Division's steering committee for approval. The plant management has committed to either approving or explaining their rejection of the team's solution.

** J - use to introduce your curriculum.

"As we prepare for the next century, the planning "movement" calls on institutions not only to identify their strategic position... but also to set goals to insure ... effectiveness and continuous improvement" (Elifson 1995). Programs must set specific teaching/learning objectives, develop action plans for moving programs toward the achievement of objectives, and develop assessment instruments that will measure achievement.

Programs are increasingly viewed as strategic investments, and education providers are accountable.

Assessment and improvement plans developed by carefully constructed in-house Education Planning Teams are better able to be self-determined and proactive.

W. Edwards Deming's (1982) work on management reverberated into George Keller's views of academic administration.

Keller views strategic planning as characterized by six features:

- a) an active versus passive role in shaping the future
- b) an outward and focused view toward the changing environment
- c) a recognition of competition and economic market conditions
- d) a highly participative decision-making process
- e) a blending of rational and economic analysis, political maneuvering, and psychological interplay, and
- f) an attention to the fate of the enterprise.

The steps in the strategic planning process generally include collection and analysis of data, development of mission and vision, establishment of planning assumptions, setting of goals and objectives, identification of implementation strategies, and assessment of outcomes. (Elifson 3)

Deming, W. Edwards. *Out of crisis*. Cambridge, MA: Center for Advanced Engineering Study, Massachusetts Institute of Technology. 1982.

Elifson, Joan M. et al. "Planning for and assessment of developmental programs." *Journal of developmental education*. Fall 1995 2+.

Follinsbee, Sue and Paul Jurmo. *Collaborative Needs Assessment*. Ontario, Canada: ABC Canada. 1994.

Jurmo's tech notes

Keller, George. *Academic strategy: The management revolution in American higher education*. Baltimore, MD: The Johns Hopkins University Press. 1983.

APPENDIX F

Portfolio Assessment Evaluation Sheet Behavioral Objectives:

Name: _____

Chapter 1 - Career Skills Identification:

- Ability to participate in discussion of paradigm shifts.
- Ability to create a skills resume accurately reflecting skills and training
- Ability to create a one-year and five-year skills development plan which reflects increased awareness of workplace changes and SCANS competencies
- Ability to complete
 - Portfolio cover sheets, accurately reflecting awareness of skills
 - Things I Learned in Class, indicating deliberation
- Increased attendance at on-site courses (per H.R.)
- Increased enrollment in off-site high school adult ed or college courses. (per H.R.)
- Increased volunteerism at work (arriving 5 minutes early, participation in PIT teams, etc.) (per supervisor)
- Increased volunteerism off-site in activities which will develop work-related SCANS competencies (self-reported)

Chapter 2 - Decision Making Tools

SCANS - Thinking (Creative thinking, decision making, problem solving, seeing things in the minds' eye, learning, reasoning)

SCANS - Systems (Understand, monitor, correct, improve, design)

- Increased ability first to generate and then to organize work-related information in order to complete
 - a T-chart
 - a weighted chart
 - a Fishbone diagram
 - Ability to accurately read a Flow chart in order to go to the proper step at the proper time to get an overview of a system
 - Ability to participate in completing a Force Field Analysis (in class)
 - Ability to work in a group
- SCANS - Basic Skills** (Read, write, calculate, listen, speak)
- Increased ability to read and understand Menands Dryer Divisions' insurance material. (self-reported)
 - Increased ability to read, understand & complete necessary insurance forms.(per H.R.)

Chapter 3 Business Systems and Financial concepts

- Increased questions in Human Resources (Per H.R.)
 - Increased participation in the employee pension plan
 - Increased employee purchase of Albany International stock (per H.R.)
Expanded Worker/stockholder's pride in product and sensitivity to larger issues impacting on the workforce as a result.
- SCANS - Interpersonal Skills** -- Team, teach, lead, negotiate, work with diversity)
- Increased ability to contribute meaningfully to a team:
 - courage to speak one's ideas
 - ability to articulate clearly
 - ability to evaluate relevance of idea to topic
 - ability to discuss without confrontational language
 - ability to negotiate
 - ability to work with diversity (age, gender, ethnicity) (per supervisors, team colleagues)

A1 (m)
F1

APPENDIX G

Spring 1995 Class Goals:

Paul
This is where we
started from

5

Individual Goals

- 1.) To discover my strengths, aptitudes and preferences
(the things we do well and the things I like to do)
so that I can use this knowledge as a basis for further growth.
- 2.) To discover my weaknesses, so that I can
 - * be aware when they are preventing my job growth
 - * gain those new skills, abilities and attitudes which will help me
with **What I Want to Happen.**
- 3.) To learn to accurately identify problems at work and at home through problem
identification techniques.
- 4.) To learn many problem solving techniques,
(Flow charts, Force Field Analysis, Fishbone diagrams, etc.)
so I can select the best one(s) for any situation, at work or at home.
- 5.) To develop the skills needed by process improvement teams (interpersonal,
problem solving, spoken and written communication).
- 6.) To build a portfolio which will communicate to management
 - * my many skills and abilities
 - * my goals at Albany International
 - * my training and education intentions and needs.

Group Goals

1. To accurately identify a problem related to the stated WNA areas of
communication between labor and management,
promotions and lateral moves,
training needs
rewards for skills and effort.
2. To prepare a Force Field Analysis and a Fishbone diagram of the problem.
3. To develop a proposal to submit to management of a process which will
 - * resolve the problem to the benefit of all parties concerned,
 - * at a realistic cost
 - * in a realistic time frame.

AI(m)
GI

APPENDIX H

1. Can workers show development of skills in the classroom?

2. Can workers show development of skills on the mill floor?

3. Do the skills benefit the company and/or the worker?

#####

What evidence (measurements) will we accept for each?

Overhead used as source of EPT discussion today

APPENDIX I

Draft

WORKPLACE NEEDS ANALYSIS ALBANY INTERNATIONAL -- MENANDS DIVISION

Draft submitted To Bob Knowler 8/28/95,
by Judith M. Lees

I. Acknowledgements

The information in this report is the result of the time, energy and focused thoughts of the Albany International employees who have volunteered to serve as members of The Educational Planning Team, and who continue to contribute so much to this ongoing process: John Danish, Paul Gardner, Colleen Hyatt, Don VanDenburg, Bev Wright, and Al Zwack. Thanks is also due for the guidance and encouragement of Bob Knowler of the State Education Department, Mike Armstrong of Hudson Valley Community College Office of Corporate Programs, and project consultant Paul Jurmo.

In addition, I wish to thank those employees who volunteered to serve on focus groups or participate in interviews, and to those who provided me with the many workplace documents which served as a part of the Workplace Needs Assessment.

II. INTRODUCTION

A. Purpose

The purposes of a Workplace Needs Assessment are complex. It is serving to identify the Menands' plants overall education needs, with a focus on basic skills. However, it also uncovers other workplace needs -- many of which are effects of the ongoing organizational changes. Many new and/or previously undetected needs are a consequence of the company's proactive responses to the many changes in the paper manufacturing industry. The Workplace Needs Assessment strives not only to identify needs, but also to detail activities that will help employees and the company itself to meet these needs.

B. Pre-CECI Activities -- The Learning Enhancement Program

Because of the visions of the Steering Committee of the Menands Dryer Division of Albany International, much work had already been done when the CECI project began. In the autumn of 1993, Mike Armstrong and I were brought aboard through HVCC's Office of Corporate Programs to assist in the design and implementation of what became the Learning Enhancement Program.

The program was to formally begin with a test administered to all employees of the division -- both manufacturing and office employees so that no partiality was shown. Based on the results of the test, employees were to be assigned to attend basic skills classes during work time. The reading, writing and math skills classes were to be heterogeneously grouped to avoid potential heckling by co-workers of employees who might have been grouped into lower skills groups.

During the next several months Mike and I met in small groups with all the employees on all three shifts. These free-form meetings, although casually structured, were carefully planned to meet several objectives. A primary objective was to win the confidence and cooperation of those who would be affected by the program -- that is, every employee of the Menands plant. During these meetings, the workers expressed a wide range of emotions and concerns. Many feared that academic weaknesses unrelated

APPENDIX I (CONT'D.)

to their job skills or work habits would end up in their files, with the potential of being used against them. At the other end of the spectrum, some employees who confessed to having thrown away their opportunities during high school greeted the program enthusiastically as a second chance. Some who had suffered humiliation during their school days assumed this program would offer nothing more than a repeat of past indignities.

My primary job, it appeared to me at the time, was to assuage fears about test scores as ammunition. We reassured each group that the answer sheets would go directly to the computer at HVCC, and remain secured away from the Menands Plant. An individual's scores would be known only by that person and myself, unless he or she chose to share the score.

Study Skills, Test-taking and Math Refresher Workshops were the offered outside of work hours before the exam.

The ASSET Test

In November of 1993, HVCC administered the ASSET test to all employees - manufacturing and office workers -- of the Dryer Division. Scores reflected the following:

- Writing 73.2% wrote below high school level
- Reading 32.6% would be unable to derive meaning from college level texts
23.2% would need assistance using complex technical reading material
25.0% fell in a grey area.
- Numerical 31.7% were unable to perform basic numerical functions
(whole numbers, decimals, fractions)
13.3% would need assistance to perform basic numerical functions

In January of 1994, 10-hour Business Writing classes were begun, dealing with both composition and grammar of business documents. Initially attendance at the heterogeneously assigned classes was mandatory, but the benefits to the class, the company and the employee soon dictated that only those who were interested need attend the Learning Enhancement classes. The writing classes were followed by 10-hour Technical Reading classes emphasizing analytical skills and the organization of thought patterns. The company is presently involved in the final stages of the 10-hour Shop Math component of the Learning Enhancement Program.

Off-site, off-hours Computer Fundamentals courses have been offered with no-great success, but much attrition can be attributed to extensive overtime work offered and/or mandated during the past year.

APPENDIX I (CONT'D)

III. CECI Activities

A. Examination of Documents

Documents were examined for vocabulary level, sentence length, contextual density, gender bias, etc.

Human Resources Documents

Employee Handbook - section on how to file a complaint
Health Care Plan -- (Summary Plan Description)
Employee Guide -- Prosperity Plus (Summary Plan Description - 1988)
Employee Guide -- Retirement Plus (4/1/94)
Understanding Your Managed Prescription Drug Program
PCS Managed Prescription Mail Service Program
Equipment Manual from new machine
Weavers' paperwork for end of shift.

Newsletters

AI Information Memos
AI Mount Vernon Dryer Fabrics: About Menands
Dryer Product Committee Newsletter - 12/94

B. Formation of Educational Planning Team

The workforce at the Menands Dryer Division consists of approximately 300 workers, 200 of whom work first shift.

Employment has been stable for many years. As a result, most workers have been there for more than a decade, many for more than two. The company is paternalistic and puts significant effort into training workers and placing them into positions where they can succeed. Thus workers tend to have the training necessary to perform present functions to extremely high quality standards.

Albany International dominates the national and international paper machine clothing markets. There is great pressure to maintain its market share by providing top quality products in a competitive time span at a reasonable price. The company must keep pace with its competitors as rapid changes take place both in technology and processes. As improved technology becomes available on the global market, anyone with sufficient funds can purchase it. Therefore, continued success hinges tightly on the maintenance of a highly skilled and motivated workforce -- something which a competitor cannot purchase at a moment's notice.

Thus, the purpose of Albany International's participation in this project is not the elimination of existing problems in its manufacturing workers, but rather their preparation for the rapid changes coming in the future.

The Educational Planning Team consists of four employees from the manufacturing sector and two from the office sector.

Of the manufacturing sector:

Three are males, one is a female.
Two have completed some college courses, two have not.
Three are first shift, one is third
Two are union, two are non-union.

APPENDIX I (CONT'D.)

Three are in their thirties, one is in her fifties.
All are achievement oriented and forward thinking.
All are native speakers of English.

The office workers are represented by two human resources professionals responsible for the training and development function.

We initially requested participation of two non-native speakers of English to represent the Italian males who are mostly first shift weavers and the Polish females who are mostly second shift pin-seamers but a shift change for one and an automobile accident for the other resulted in lack of representation of this small but significant group on our EPT.

C. WNA Question Development

Questions and an Invitation-to-Participate form were developed by the EPT. Sue Follinsbee's book informed the education provider's initial draft of questions, which was then reviewed and amended by the EPT. Invitations and RSVP forms were freely circulated in break rooms and through supervisors at weekly meetings.

Responses were as follows:

Finishing/Pinseaming/Warehouse (70 ees)	8 first shift, 3 second shift
Corrugator (16 ees)	1 first shift, 1 second shift
Buildings and Maintenance (23)	3 first shift, 1 second shift
Weaving (64)	7 first shift, 3 second, 2 third
Needling (11)	1 first shift
Administration	5 first shift

IV. Retrospective

Many factors contributed to employee's participation or lack of same.

Production Requirements – This first year of the grant has co-incided with a boom in paper production following several difficult years. Shortly before the grant activities began, Albany International offered a retirement sweetener in a successful effort to cut its workforce because product demand had been low. The reduction in the number of highly skilled workers was advantageous until the sudden spiral in paper production. Because skilled and experienced workers are necessary to produce the quality of product that has made Albany International a global leader and a recipient of the Excelsior Award, the increased demand for paper machine clothing has resulted in mandatory weekend overtime and available evening overtime for workers in many departments. The extended period of depressed economy in the North-east (especially New York and nearby Massachusetts) and the recent memory of the early-retirement has cause many employees

APPENDIX I (CONT'D)

to accept all the overtime opportunities they are offered. The volume of work at their work-stations prevented many from attending WNA sessions.

Centennial Celebration -- This year (1995) brought Albany International's 100th birthday. The fact that this momentous even coincided with a year of enormous profits and positive stock value resulted in the development and implementation of a Centennial Bash that required enormous focus, especially on the part of Human Resources and Building and Maintenance staff. (All the Building and Maintenance employees who had initially volunteered for participation in the classes withdrew when they discovered they were consistently working twelve hour days.)

Learning Enhancement Program -- What's past is prologue, and the strengths and weaknesses of the Learning Enhancement Program impacted on the Workplace Needs Analysis. Many felt that the Program was a positive first step; these often chose not to participate in the WNA because their needs were on the way to being met. Others saw the Program as another in a series of unwelcome attempts to subject them to an uncomfortable classroom environment and to take them outside their kinesthetic comfort zone; these sometimes chose not to contribute to the WNA because they lack faith in the system.

I had an advantage over education providers at many sights because I am already a familiar sight on the floor. Teaching writing skills offers a chance for an intimate dialogue with students, so I had already had the opportunity to earn the trust of those students I had had in writing classes. Because almost all who needed assistance in writing also were enrolled in reading, I had an additional 10 hours of class time to further establish rapport.

Thus, although only 35 employees participated in the formal WNA sessions, many employees took the opportunity to discuss issues with me in the break-rooms, hallways, or cafeteria as well as at their work-stations. Learning Enhancement Program responsibilities such as distribution of class schedules from area colleges for employees or their children often offered an opportunity to discuss work related issues.

Excelsior Award

The very nature of Albany International as a company, and the Menands Dryer Division as a plant makes its stakeholders' needs vastly different from the needs of stakeholders' at most of the other participants. Remediation of weaknesses in skills required on the job is not the issue here, because workers are not promoted until their skills are sufficient to ensure that the the company can continue to consistently produce top quality fabrics. Most of the workers have been there for two decades or more, and workforce reductions over that time have mostly been through normal attrition. The company is paternalistic in that it finds work for its people during slow times, but workers know they must meet stringent job standards or be moved to another job. The Peter principle doesn't fit here.

The international market for its products has brought ISO audits and their requisite training and attitudes into the workplace. In addition, the fierce global competition tends to ensure that consistent production of top quality fabrics is the only option for a company to remain viable. Thus training is frequently offered in new materials, new equipment, and new philosophies. Sometimes it is required, sometimes a reward for initiative.

AI (m)

Curriculum and individual assessment at Delphi

(as of January 1996)

How the site is interpreting "curriculum"

The needs being addressed

The Delphi plant manufactures fuel injection systems for General Motors trucks. It is in the midst of creating a new product line, with new work processes and new work teams. That line will have volunteer employees and require better communication and attention to quality. (GM said it will buy its fuel systems elsewhere if the plant doesn't meet quality standards.) The basic skills program is seen as a tool for helping the plant make that shift.

One area which the Rochester City Schools staff has focused on in its initial phase of instructions is statistical process control. In the past, the plant had run SPC-related math activities, but found that workers often couldn't transfer what were somewhat abstract math skills back to the workplace.

The EPT agreed that this time they would try to link SPC-related training more directly to the actual SPC skills workers needed for the particular decisions and problems they needed to deal with for this new product line. In such a curriculum, a number of SCANS skills (e.g., math, teamwork, decision-making) would be dealt with at once.

The process being used to develop the curriculum

RCS staff had already had a history of working in this plant. Under this new, federal grant, RCS staff worked with an existing team which had been set up to oversee the plant's transition to the new product line. In early 1995, the team did a modified workplace needs assessment, reviewing the strategic plan which the team had already developed, to clarify where the CLCI problem-solving curriculum might fit in.

Because SPC was a clear concern, math instructor Geena Porter devoted special attention to finding ways to make math instruction relevant. She worked with managers, a quality

Delphi
D. 1

analyst, engineers, and others on the shop floor to review what kinds of math and communications functions were of particular concern. She found that SPC was needed to help employees keep track of output from the new, precision machines being used to create parts for the fuel injection systems.

Each machine produces statistics charted on a graph, which show the numbers of parts produced and measures of the quality of the product. Workers need to be able to read those graphs; understand the mean, medium, mode, and range of the statistics; and make decisions based on that understanding.

Geena developed a focused workshop which would help workers understand those math functions. They would then practice working in groups to make decisions about whether and how corrective action was needed.

The content and formats used in the curriculum

In the second half of 1995, three groups of learners met in classes of approximately ten workers. Most participants were motivated to "clear out the cobwebs and try their hands at" upgrading their skills in this area, which they see as important.

In a typical class, participants worked on their own and in small groups. They focused on the vocabulary, concepts, and math functions contained in the charts. This understanding is necessary to enable them to talk with engineers, to diagnose and solve problems. Learners also developed self-esteem and personal motivation, oral communications, and information-finding skills. All of these are important for ISO 9000 certification as well as for day-to-day quality operations and preparation for further training.

Geena feels that all levels of management (not only higher-level managers but supervisors, as well) need to be receptive to the increased decision-making and involvement of shop floor workers. This requires changes of attitude at the management level. This is not always easy, given the busy schedules and multiple concerns of managers and historic relationships and dynamics between shop floor workers and supervisors.

Elements of a typical lesson plan

The SPC math curriculum (called "SPC Training") consists of two three-hour sessions:

Delphi
D. 2.

Day 1: Learners focus on statistics on the MetriStat charts used on the floor.

Day 2: Learners focus on team-building and problem-solving, using simulations of a PEP team situation to practice making decisions and solving problems shown on the MetriStat charts. (For example, they are given a chart with data in the red zone. They need to analyze what the problem is and then decide what to do, using flow charts which show what steps to follow to solve particular problems.)

The problem-solving exercises are proving to be very popular, seen as relevant by learners. Learners are now better at understanding and applying some of the team problem-solving training they had received previously, some of which might have been too complicated, with too many steps.

Geena relied on input from the EPT to help her develop the flow chart used in these activities. Learners also gave her feedback on the chart, and she will be revising it as learners get more experience using it.

Geena used this curriculum three times, revising it after each iteration. She feels she can now use it elsewhere using different charts and data. She acknowledges that plants still geared to more-traditional ways of solving problems might not feel comfortable with this curriculum. In those traditional settings, workers might expect that their supervisors will make the decisions and therefore see no relevance in learning how to solve problems themselves. She feels, however, that as higher-level managers go through team training themselves and ISO certification requires more shop-level decision-making, these traditional ways of making decisions will inevitably change.

Other support activities

Geena also oversees activities at the plant's skills center, which has computer-assisted activities and other services. In that capacity, she provides informal tutoring and counseling to workers. These additional supports supplement what she does in her math courses.

Geena has done an informal evaluation of the first round of her three SPC classes, via an exit questionnaire and informal interviews with participants. In this feedback, participants generally spoke favorably of the course, saying it was useful and

citing examples of how they are now using the concepts and procedures in their work.

She hopes to do a more-formal evaluation several months after the end of classes, but sees workers' busy schedules as an obstacle to her sitting down with learners for any length of time. This is complicated by two factors:

1. The plant is very focused now on preparing for ISO9000 certification. Basic-skills-related training is only one of several initiatives workers must pay attention to.
2. A key member of the EPT has moved on to another job. This team member had been very supportive of the education program, ensuring that workers were able to get free to participate in classes, assessments, etc. Her departure could mean less flexibility in workers' availability for learning activities.

Plans for 1996

Another instructor joined the program in the fall of 1995. He is working with another product line department, one which has worked together for some time. He is doing a modified WNA to determine what needs to focus on in his curriculum. As of this writing (in early 1996), it appears that the team wants the curriculum to focus around problem-solving and team-building, but the specific problems and skill needs are still to be determined.

How the site is interpreting "individual assessment"

The forms of individual assessment being used

The process of introducing and using portfolios

As part of the above learning activities, Geena asked each participant to keep a folder with examples of his/her work. She acknowledges, however, that this course is only a six-hour course and can therefore produce only a limited amount of evidence.

One issue to resolve: Should the portfolios be oriented to showing mastery or progress or both? (Mastery, she says, is useful for accountability and motivation for both individuals and the company.)

Delphi
DA

Once Geena received the learners' portfolios, she reviewed them, using rubrics she had developed, to clarify the extent to which they had mastered what was being taught. Her rubrics (See accompanying page.) were developed with input from EPT members. To create the rubrics, she identified several learning objectives and then noted possible indicators which would show whether those objectives were met.

Improving how we "do" curriculum and individual assessment

Questions to resolve

Geena has identified an interest among learners in improving their blueprint reading skills. She would like samples of blueprint-reading curricula (especially basic "intro-to-blueprints" courses and courses which use computer-assisted formats) to use in her planning. (She feels computer-assisted formats allow/encourage workers to practice -- in private and at their own initiative -- learning activities of interest to them. This helps reinforce their taking initiative for their own learning.)

Conclusion

Future editions of this Tech Note will provide additional information about the Delphi site's curriculum and individual assessment work.

Sample documents

Attached are five documents from Delphi:

Document A: Curriculum Outline

Document B: Five-Step Problem Solving Process and Activity

Document C: Problem Flow Diagram

Document D: Problem Scenario Team Activity

Document E: Class Evaluation Rubric (a one-page example)

Delphi
D 5

DELPHI: DOCUMENT A

Curriculum Outline

♦ The objective of the class will be explained: "The students will use the audit stand data to create and analyze *X-bar and R charts*. Students will be able to determine why a part or set of parts are classified as belonging to either a Green, Yellow, or Red zone classification. Students given the audit stand data will be able to use the *Five Step Problem Solving Process* to initiate the correct course of action. Students will also be able to utilize Statistical Process Control as a means of understanding and communicating problems.

♦ Instructor will demonstrate how to :
Determine the mean, median, mode, and range.
Analyze the data and formulate an evaluation statement.

Students will work in teams of two to locate information found in/on different charts and diagrams provided for them and will :

1. Determine and state what each axis represents.
2. Locate certain data points.
3. Be able to calculate/determine the mean, median, mode, and range.
4. Be able to write an *evaluation statement* about the data .

♦ Students will be introduced to the data from the audit stand. They will understand what each piece of data is.

♦ Students will create a *X-bar and R chart* given the data from the audit stand.

Students will work in teams to locate information found in/on the *X-bar and R chart* they created :

1. Determine and state what each axis represents.
2. Be able to calculate/determine the mean and range.
3. Locate and plot the data points.
4. Be able to write an *evaluation statement* about the data .

♦ Students will be introduced to the classifications of Green, Yellow and Red flow zones.

♦ After seeing a demonstration , students will label Green, Yellow, and Red zone classification on the *X-bar and R charts* they have created.

♦ The class, as a team, will use the *five step problem solving process* to respond to a problem scenario.

They will be able to write each step of the process and communicate the proper information
They will determine and communicate in writing the correct action to initiate

Delphi
A ①

DELPHI'S Document A

- ◆ **The class will break into teams of 3 to 5, each will use the five step problem solving process to respond to a problem scenario.**

They will analyze data by using a X-bar and R chart to verify the problem.

They will be able to write each step of the process and communicate the proper information

They will determine and communicate in writing the correct action to initiate.

They will report back to the class their analysis of the problem. They will demonstrate how they used the *five step problem solving process* to arrive at their conclusions

- ◆ **The students will discuss the 5 step problem solving worksheet. They will be asked what they liked, what worked, what did not, and decide if there are ways to make it better.**

Delphi
A (2)

Problem Solving Process

1. Identify:

State the problem so that it is clear and precise.

2. Analyze: Decide on the cause of the problem.

Collect data:

Brainstorm possible causes of the problem.

Group similar causes into broader categories.

Collect actual data like measurements, number of occurrences, opinions, charts ...

Re-evaluate the cause of the problem after collecting more data.

3. Plan: Decide how to solve the problem.

You may:

Brainstorm possible solutions.

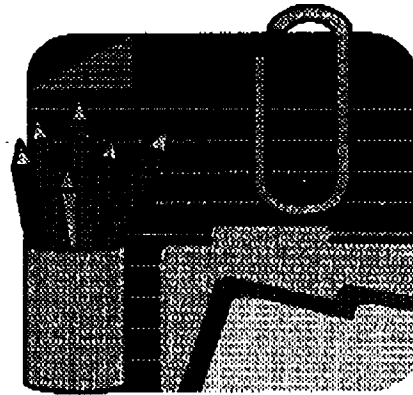
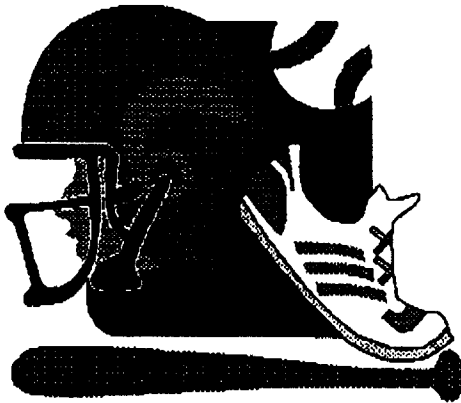
See an obvious solution and not need to brainstorm.

Collect more data in order to determine the solution

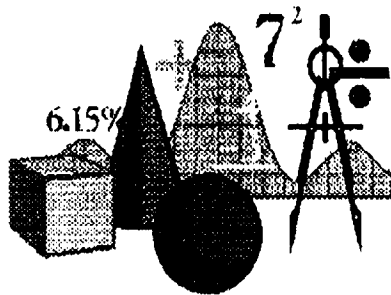
4. Implement: Put the solution into action.

5. Evaluate: Evaluate both the problem solving process and solution.

DELPHI: DOCUMENT B

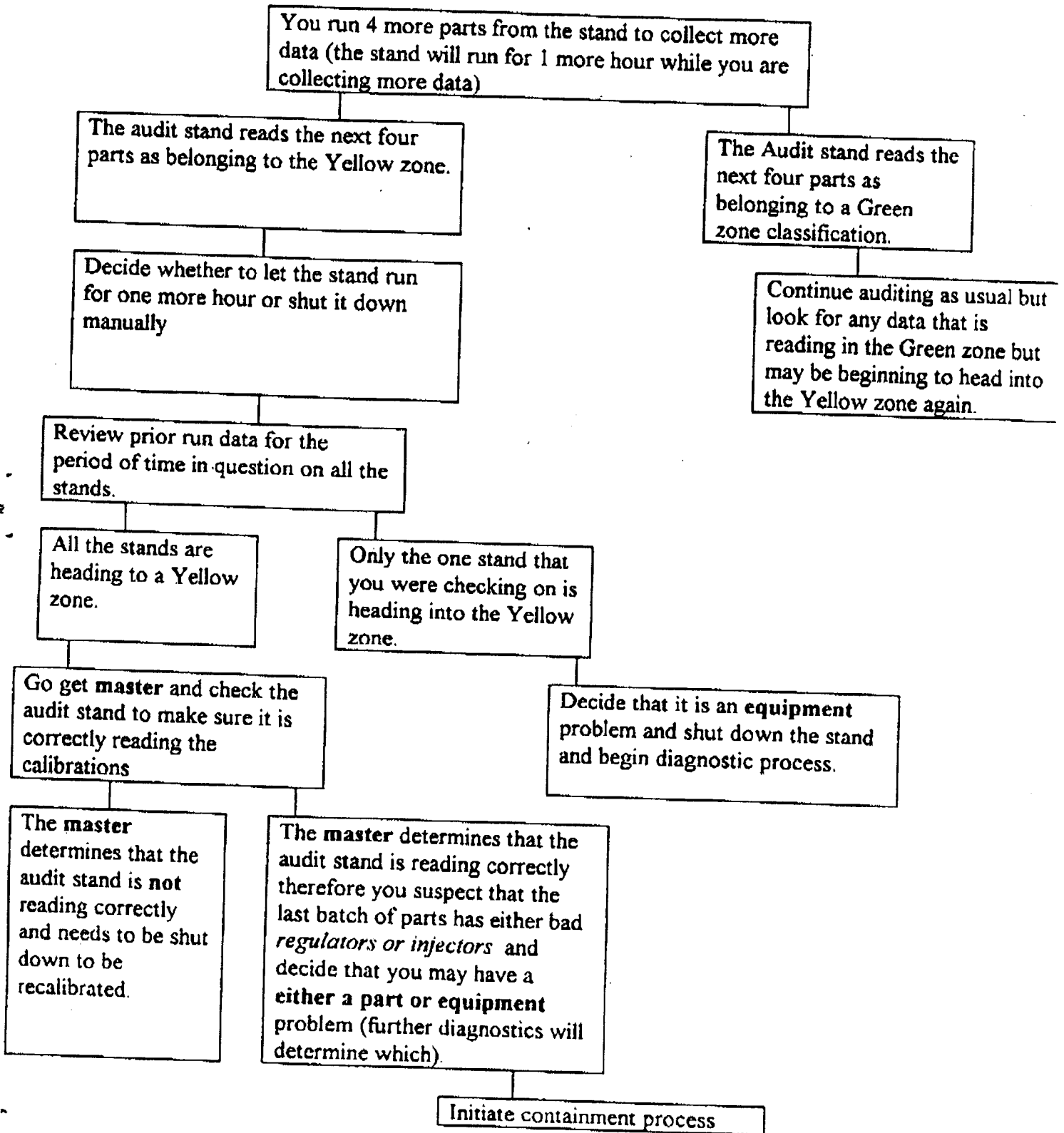


The management has decided that they would like to increase productivity by increasing the workforce's morale. In order to decide how this should be done they have created the P.E.P Team (Pride in Educational and Physical well-being). They will decide how to use the \$250,000 that the company has designated for this project. Each area of approximately 50 workers has one representative on the P.E.P Team. I would like to personally welcome each one of you representatives to the first meeting of the P.E.P Team.



DELPHI: DOCUMENT C

The problem: The Audit stand is flashing that the data is in a Yellow flow zone classification.



Delphi
ci

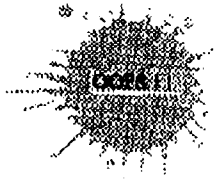
TEAM TWO

The following four pieces of data were just audited from stand A. Will the audit stand send back a reading of Green or Yellow?

3.888
3.828
3.816
3.896

If Green choose **ENVELOPE A**
If Yellow choose **ENVELOPE B**

ENVELOPE B



Try and calculate the mean again or check your upper and lower outlier limits (UCL_X and LCL_X). You should find that this group of data's mean is in the Green zone classification.

ENVELOPE A



Good Job!!! The mean was 3.857 which is in Green zone classification
The next four parts come from Stand E. Will the audit stand give you a reading of Green or Yellow?

3.899
3.892
3.920
3.898

If Green choose **ENVELOPE C**
If Yellow choose **ENVELOPE D**

Delphi
D. I.

DELPHI: DOCUMENT E

SAMPLE CLASS EVALUATION RUBRIC

◆ Students will be introduced to a *X-bar and R chart*. They will determine and locate the important information and data used to create a *X-bar and R chart*.

<p>1 Students were not able to determine nor locate the correct information from the audit stand data to create a <i>X-bar and R chart</i>.</p>	<p>2 Students determined only part of the correct information and had problems locating it in the audit stand data.</p>		<p>4 Students were able to determine and locate the correct information from the audit stand data to create a <i>X-bar and R chart</i>.</p>
---	---	--	---

◆ Students will create a *X-bar and R chart* given the data from the audit stand.

<p>1 Students were not able to determine nor locate the correct information from the audit stand data to create a <i>X-bar and R chart</i>.</p>	<p>2 Students determined only part of the correct information and had problems locating it in the audit stand data, so they were not able to make a <i>X-bar and R chart</i>.</p>		
---	---	--	--

Students will work in teams to locate information found in/on the *X-bar and R chart* they created:

1. Determine and state what each axis represents.
2. Be able to calculate/determine the mean and range.
3. Locate and plot the data points.
4. Be able to write an *evaluation statement* about the data.

<p>1 Students could not correctly label or state what each axis represented</p>	<p>2</p>	<p>3 Students did not correctly label or state what one axis represented</p>	
---	----------	--	--

<p>1 Students were not able to correctly define nor determine mean and range.</p>	<p>2 Students were able to correctly define mean and range but could not perform the calculation/determination.</p>	<p>3 Students were able to correctly define mean and range but made errors in the calculation/determination of mean and range.</p>	
---	---	--	--

<p>1 Students could not locate any of the data points given to them.</p>	<p>2 Students could locate less than half of the data points given to them.</p>	<p>3 Students could locate most of the data points given to them.</p>	
--	---	---	--

Delphi
E-1

**Curriculum and individual assessment
at
Eastman Kodak**

(as of October 1995)

How the site is interpreting "curriculum"

The needs being addressed

Kodak has for several years been making the transition to a team-based, "high-performance organizational model. Also, the new company CEO has placed an increased emphasis on employee training. The CLCI program model was seen as a vehicle for helping the company meet those goals.

The process being used to develop the curriculum

Rochester City Schools had during this period provided various kinds of basic education services to Kodak employees. RCS staff explained to Kodak training staff the team problem-solving model being developed under the federal grant. Kodak felt that this model could help the company meet its training goals and gave RCS the go-ahead to form three problem-solving classes.

In their initial meetings with RCS staff, the three classes (each from a separate work area) identified a number of workplace problems to focus on.

The content and formats used in the curriculum

The classes then merged the initial version of a problem-posing model proposed by NYSED with Kodak's own internal problem-solving process. The classes analyzed the causes and possible solutions for various problems and developed action plans to present to the EPT and management representatives.

How the site is interpreting "individual assessment"

The forms of individual assessment being used

The three Kodak classes have been using a form of portfolio assessment. Details of the content of the portfolios and how they

were developed and used will be presented in future editions of this Tech Note.

Improving how we "do" curriculum and individual assessment

Questions to be resolved

The Kodak team has identified a number of questions, including:

- 1. What needs to be done to ensure that what is learned in the problem-solving course is used back on the floor, is integrated with other training and change activities, and is not seen as a threat by supervisors and others in the plant?*
- 2. What is the proper role of outside educators in helping a company deal with internal problems?*
- 3. What should a site do if the "problems" a learning group uncovers are more "social" (interpersonal, political, etc.) in nature than "technical" (mechanical . . .) ones?*
- 4. How should a site respond to learners' interest in having clear evidence of what they are learning, especially if they are oriented to "tests" and not all that familiar with alternative forms of assessment like portfolios?*
- 5. How can the curriculum and assessment be geared to help supervisors help employees prepare for future job and training demands?*

Sample documents

Future editions of this Tech Note might include such documents as a course outline, lesson plans, individual portfolios, learner interview forms)

Curriculum and individual assessment
at
EG&G Wright

(as of January 1996)

How the site is interpreting "curriculum"

The needs being addressed

The EG&G Wright plant manufactures valves for aircraft and space shuttles. It is shifting toward a "team environment" and, as is true of most companies trying to make that shift, is struggling with the question of how to do so. The education provider, the Wayne-Finger Lakes BOCES, sees these changes as creating a niche into which the CLCI's team-problem-solving curriculum might "fit."

In 1995, site coordinator Dianne Spang attended corporate training sessions as a "participant-observer." She thereby familiarized herself with the issues the company and workers are dealing with, to ensure that her instruction meets real needs. Among other things, she found that so far shop-floor personnel aren't getting access to team-related training that higher-level employees are. She concluded that the initial round of instruction should focus on "listening and reflective response," tying the program in with the company's interest in conflict resolution.

This process also showed that many in the company want introductory computer-related training, to enable all workers to handle the plant's computerized information system.

The process being used to develop the curriculum

In the initial curriculum development stage, Dianne sat in on company "team training" sessions conducted by an outside corporate trainer.

To further clarify learning needs, she subsequently met with groups of learners and asked each group to do an illustration which portrayed their workplace. One group portrayed the company as an aircraft named the "SS Wright Products," which was flying high but having to evade various kinds of "missiles" (corporate challenges) which were trying to shoot it down. Another group portrayed a mouse in a maze, trying to find its way through unknowns and other challenges.

In another activity, learners were asked to bring three questions back to the workplace, asking co-workers about work-related needs, goals, and obstacles.

Through such interactions with learners, Dianne identified areas where productivity and communications are blocked and possible areas for process improvement. From these investigations, Dianne identified a number of possible goals and projects for each class. The groups also showed that there are various ways of interpreting the workplace and needed improvements, and that there is a value in getting input from a variety of perspectives and individuals.

The content and formats used in the curriculum

Dianne organized learners into four groups, each with an average of eight participants. In each group she attempted to mix employees from different departments (e.g., engineering, drafting, assembly, machine shop, testing, and final inspection/shipping) and levels (upper level "leaders," floor managers, and floor workers).

Each group focused on a different workplace issue or problem which it had identified in the initial needs assessment phase. The issues were:

- *How to develop a "mother board" system for tracking where work orders are in the production process.*
- *How to set up an on-site training system and facility (using in-house experts as trainers, using actual job-related problems and products in the training, etc.)*
- *How to clarify the skill requirements of each job category and then develop a cross-training system to enable employees to prepare for other jobs.*
- *How to develop a problem-tracking sheet to enable employees to analyze causes of defects and re-works and to avoid such problems in the future.*

The four groups met an average of seven times each in two-hour sessions, twice a week for a month in late 1995.

Each group went through a variation of a problem-solving activity to deal with the issue it had agreed to focus on. They identified "glitches" in the system and developed plans for the above kinds of actions to counter those problems.

In the process of developing their plans, learners developed various kinds of research (e.g., information-gathering and -

organizing) and presentation (oral and written language and math) skills. Although skill levels and expertise varied among team members, more-advanced learners tended to resist dominating the team process, and less-confident learners were encouraged to "stretch" themselves.

As they developed their action plans, each participant was expected to go out on the floor and present the team's draft recommendations to three co-workers. Learners noted the co-workers' responses and brought them back to the group. The group in turn incorporated those responses into their final presentations.

Participants were encouraged to decide what roles they would play when their groups presented their action plans to the plant leadership team. (Most made an oral presentation, but one participant preferred to organize the slides on the overhead projector.) Each group member was asked to prepare a "script" which he/she could refer to during the presentation.

The groups made their presentations in late 1995. The leadership team considered the plans for four weeks, then asked the groups to be more specific about costs of their recommended actions. Dianne is now working with some of the groups to come up with budgets.

For 1996, Dianne expects that the EPT will like to move on to the question of how to help workers use the plant's computerized information system.

How the site is interpreting "individual assessment"

The forms of individual assessment being used

Dianne has been using portfolios for both individuals and for groups.

For each learner, she is gathering artifacts which show what each learner is producing. She also asks them to reflect on the activities and give her feedback.

She is developing a post-course survey in which individuals will clarify (a) whether and how they improved various SCANS competencies in the class, (b) whether and how they are now using those competencies back on the job, and (c) what impact those uses of SCANS have had on the workplace.

She is also pulling information from those individual portfolios to include in a class portfolio for each group. That portfolio will also include the group's action plan.

Dianne would like more ideas on what to include in the portfolios (especially for the outside evaluation). She feels that the EPT at present is not asking for highly-quantified data, but that she nonetheless would like to know how to develop systematic rubrics which might produce such data in case anyone wants it.

Improving how we "do" curriculum and individual assessment

Problems encountered so far

Dianne feels that this process has been successful so far, even in the busy corporate environment. She feels that it will be useful to get broader representation (from managers, supervisors, et al) in each class, but the EPT needs to figure out how to do so, given everyone's busy schedule. This will ensure better cross-fertilization of information and ideas and reinforce cross-training, teamwork, and other features of team management.

"Positive lessons" (good ideas) to share

Involvement of team leaders is particularly important as a way of helping them to understand and support the program. She cites two team leaders who have been involved in the program's planning and early activities from the start. Those two have been positively impressed by the program's impact on opening up communications channels and now want to transfer this group-learning process to how their teams operate out on the floor.

Dianne feels that the process has been successful due to a number of factors, including:

- *A new manager who has shown real interest in the program (e.g., writing letters of encouragement to participants).*
- *An EPT which encourages all key stakeholders to participate in goal-setting, in the classes, etc.*
- *A leadership team which has bought into the problem-solving curriculum model, paid attention to the groups' reports, etc.*
- *Integrating of practice in SCANS competencies with actual problem-solving activities which focus on real, important workplace problems.*
- *Opening the program to all employees, but not mandating that anyone participate.*

- Encouraging employees to "stretch" themselves but respecting that some might not feel confident to take on roles (e.g., public speaking) they aren't accustomed to.
- The company's providing of release time to enable workers to participate, and the company's willingness to expand the number of class sessions as needed.
- Having participants go out on the shop floor to get input from co-workers. This not only ensures that group recommendations are relevant to workers on the floor but facilitates understanding and buy-in from workers.
- Allowing workers to select their own problems to focus on and respecting their insights and experience in the problem-solving process.
- Use of innovative instructional techniques (e.g., using "etchings" to depict workplace issues).
- An organizational context which encourages employee participation in problem-solving.
- Mixing levels and departments in the same group, while respecting the limitations and strengths of individuals.
- Activities which help workers to make intuitive knowledge more explicit, systematic, and shared with co-workers.
- Willingness of participants to "stick with it" and work with co-workers in the problem-solving process.

Conclusion

Future editions of this Tech Note will provide more information about this site's curriculum and individual assessment, as well as sample documents from the site.