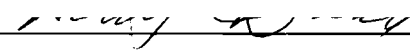


AN ABSTRACT OF THE THESIS OF

Edward M. Risser for the degree of Doctor of Education presented on May 1, 2001.

Title: Social and Learning Strategies Male Community College Students Use to Maximize Learning from Cooperative Work Experiences.

Abstract approved: *Redacted for Privacy*

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Employers often lament that many American workers are not qualified for present and future jobs due to changing skills requirements and deficiencies of schools. In 1991, the Secretary of Labor's Commission on Achieving Necessary Skills (SCANS) report recommended educators use work sites to help students achieve foundation skills and workplace competencies. Through cooperative work experiences (CWE), many community college professional/technical programs place students in actual work situations as part of program requirements. These experiences enable students to apply classroom learning while engaged in productive work related to their specialties.

The purpose of this study was to identify and describe social and learning strategies male community college students use to maximize learning from cooperative work experiences. Three conditions influence these strategies.

1. Every work experience situation is unique. Numerous environmental and personality variables affect the quality of the work experience.
2. Trainers are employees paid for the work they do. Productive work is their first priority; training is secondary.
3. Work site trainers are knowledgeable and highly skilled but may not be trained to teach.

Based on in-depth interviews with male students and trainers/supervisors, this study found that (a) a candid and respectful relationship between student and trainer must exist before a trainer will share fully his expertise and knowledge with the student and students have primary responsibility for establishing and maintaining this relationship, (b) the effort a trainer is willing to expend on training reflects his perception of a student's eagerness to excel and willingness to work hard, and (c) students have primary responsibility for managing their own learning during work experiences.

Students use four primary learning strategies to maximize their learning during a CWE: (a) applying cognitive apprenticeship processes, (b) solving problems, (c) recognizing and pursuing incidental learning opportunities, and (d) practicing technical skills.

Although the subjects of this study represent only a segment of professional/technical programs, the findings may be useful for preparing other program students for their work experiences.

**Social and Learning Strategies Male Community College Students Use
to Maximize Learning from Cooperative Work Experiences**

by

Edward M. Risser

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Edward M. Risser, Author

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Social and Learning Strategies Male Community College Students Use to Maximize Learning from Cooperative Work Experiences

CHAPTER 1

INTRODUCTION

An occupation is the only thing which balances the distinctive capacity of an individual with his social service. To find out what one is fitted to do and to secure an opportunity to do it is the key to happiness.

An occupation is a continuous activity having a purpose. Education through occupations consequently combines within itself more of the factors conducive to learning than any other method. It calls instincts and habits into play; it is a foe to passive receptivity. It has an end in view; results are to be accomplished. . . . The only adequate training for occupations is training through occupations.

The discovery of capacity and aptitude will be a constant process as long as growth continues. It is a conventional and arbitrary view which assumes that discovery of the work to be chosen for adult life is made once for all at some particular date.

— John Dewey (1916)

Employers often lament that many American workers are not qualified for present or future jobs due to changing skill requirements and education deficiencies (Darrah, 1994). A 1991 report by the Secretary of Labor's Commission on Achieving Necessary Skills (SCANS) found most young people leave school without the knowledge or foundation skills required to find and hold a good job. The report predicted these people face bleak prospects of dead-end work interrupted only by periods of unemployment.

The SCANS report identified several foundation skills and workplace competencies people must have to be productive employees. These foundation skills were basic reading, writing, mathematics, listening, and speaking; personal qualities such as accepting responsibility, honesty, sociability, and self-esteem; and thinking skills such as knowing how to learn, making decisions, thinking creatively, reasoning, and solving problems. Workplace competencies included knowing how to use resources, work on teams, serve customers, acquire and evaluate information, understand social and technical systems, and apply technology.

According to the report, the globalization of commerce and industry and explosive growth of technology on the job significantly changed the world of work during the last quarter of the 20th century. Schools are not producing enough people with basic workplace competencies to meet the demands of today's highly interactive and technical workplace and employers have not accepted responsibility for human resources development. The report called for educators to change instructional strategies and use workplaces as learning sites (Taylor, 1995).

A college cooperative work experience (CWE) does just that. It uses workplaces as learning sites for students. In a typical cooperative work experience, students spend periods of time engaged in productive work related to their field of study. Prior to the 1960s, most students took entire terms or extended blocks of time away from school for work experience. Since then, many students have opted to attend school and work at the same time. To gain work experience, these students arrange blocks of time for their work experiences between classes (or vice

versa), during days when they do not have classes, or during school vacation periods. This parallel school and work format enables students to immediately practice skills and apply principles and theories learned in the classroom. For many students, especially community college students, income derived from work experience is an important factor in being able to afford college. Since most CWE positions are paid (86% according to a 1998 Clearinghouse for Cooperative Education survey), students can fulfill educational and economic needs simultaneously.

A cooperative arrangement between educational programs and businesses is not a new concept. Nearly a century ago at the University of Cincinnati, Dr. Herman Schneider introduced the concept of combining work and study as an integral part of the educative process for engineering students (Tyler, 1961). Schneider believed if students spent a portion of time working in industry, applying the knowledge and theory gained in school to practical work situations, their education would be richer and more meaningful. Since then the application of Schneider's concept, now called cooperative work experience, has been an important aspect of the college curriculum for tens of thousands of students. Based on a 1998 survey conducted by the Cooperative Education Association, there are 600 cooperative education programs at two- and four-year U.S. colleges and universities. These programs place over 250,000 students at more than 100,000 work sites annually.

The Community College Cooperative Work Experience

Ryder (1987) described cooperative work experience as “experiential learning in which students engage in institutionally-sponsored productive work that is integrated into students’ academic program curriculum” (p. 2). According to Ryder, “The essence of cooperative education is that it is a strategy to provide students with experiences that are applicable to their future working lives and to their roles as informed, responsible citizens” (p. 8). In this document the conceptual term, cooperative education, and the practical term, cooperative work experience, are used interchangeably.

In community college professional/technical programs, students learn general principles, theories, and introductory technical skills in classrooms and laboratory settings. A work experience component (which may be described as a practicum, clinical, or cooperative work experience) enables students to realistically practice skills learned in class and to gain job experience. During work experiences students make connections between classroom learning and the world of work and can take advantage of the broad range of learning opportunities that arise from being on a job. Typically, learning objectives established for CWE students are broadly stated and pertain to topics related to classroom curricula (Wilson and Lyons, 1961).

Students' Perspective of CWE

Many community college professional/technical programs require, or strongly recommend, a work experience as part of curriculum requirements. As outcomes from work experiences, students expect to develop a professional identity, grow personally, improve their employability, and clarify career goals (Page et al., 1981). Students consider CWE an opportunity to explore and develop interests, abilities and technical skills, clarify career goals, acquire both technical and general knowledge, gain a more realistic understanding of contemporary society, and test their preparation for living and working in a global society (Dawson, 1989). More pragmatically stated, students see CWE as a means to develop a work history in their field of study, make employer contacts for jobs after graduation, clarify career choices, build and strengthen skills, develop work references, and earn money to help with college expenses (Student Guide to Work-based Learning Opportunities, Shoreline Community College, Shoreline, WA, 1998; p. 2.). They anticipate practice in human relations skills, exposure to role models, increased relevance and motivation for study, and improved self-reliance and self-confidence (Kerka, 1989).

Employers' Perspective of CWE

Employers who provide training for CWE students have a complementary perspective. According to a survey conducted by Weinstein and Wilson (1983), the four most important benefits for employers are to (a) recruit prospective employees, (b) accomplish challenging and practical work, (c) assess future employees before

hiring, and (d) improve relations with the college. Wiseman and Page (1983) found cooperative education students were most helpful to organizations by contributing to productivity, reducing overhead costs, and providing long-term availability of high quality professional training. Grubb (1995) found that employers recognized and gave value to the experience students gained through CWE and used the program to screen potential employees and observe non-academic capacities such as motivation, diligence, and interpersonal skills.

Connecting Work Experience and Learning

Cooperative education is at a crossroads of an “. . .unrelenting debate concerning whether American workers are adequately prepared for a world of work that is being transformed by technological and organizational innovations and global economic restructuring” (Darrah, 1994, p. 64), and the national human resource development emphasis on acquiring effective competencies through workplace learning as outlined by the SCANS report. The foundational thinking skills identified in the SCANS report are similar to the skills students develop and refine during cooperative work experiences (Wilson, 1989). To respond to this national agenda, post-secondary education and cooperative education programs must, as Heinemann and Wilson (1995) suggest, identify more effective instructional models and determine the skills students need to maximize learning in the workplace.

Cooperative Work Experience as Experiential and Social Learning

Cooperative work experience is an experiential and social learning situation. Students learn through interactions with and observations of employees in an industrial setting or place of business. Learning during cooperative work experience encompasses more than specific tasks and activities assigned by an instructor or program coordinator. Students can learn continuously about a wide range of life and work situations as they interact with employees who depend upon the work for a livelihood. From the moment students arrive at a work site, they are consciously and tacitly learning. Their learning continues later as they reflect on events and activities and make connections between classroom activities, work, and other life experiences. They learn effective, and ineffective, behaviors and attitudes pertinent to their chosen occupation and a specific organization. They create mental models to help connect classroom activities to actual workplace application (Center for Workforce Development, 1998).

People learn not only by acting and experiencing the consequences of their actions but also by observing others, by imitating models, by watching television, by seeing a demonstration, by discussing issues, even by listening to a lecture; sometimes without practice, without reinforcement, and without overt action. Cognitive elaborations, such as inferences, images, memories and analogies influence their learning and understanding. Learners often construct meaning and create their own reality, rather than respond automatically to the sensory qualities of their environment (Wittrock, 1979, p. 5).

Experiential Learning

Kolb (1984, p. 29-31) described experiential learning as a holistic process involving the integrated function of the total organism including thinking, feeling, perceiving, and behaving. Learning occurs at points where expectations based on prior knowledge and present experience are not consistent. According to Kolb, learning is a continuous re-learning process where learners bring forth existing beliefs and theories for re-examination and testing. To learn effectively from experience, students must involve themselves fully, openly, and without biases in new and concrete experiences and be able to observe and reflect on experiences from multiple perspectives. Students must also be able to integrate their observations into logically sound theories that combine experience with prior knowledge and use these theories to solve problems and make decisions.

Social Learning

According to Watkins and Marsick (1992), workplace learning takes place in a social context and involves a social contract among individuals working together to achieve organizational goals. The knowledge employees acquire affects, explicitly and implicitly, shared norms, values, attitudes, and behavior patterns. The workplace context influences how employees define situations, decide courses of action, and interact with each other. At job sites, CWE students learn in the same context as regular employees. Their learning resources are the full gamut of

life and work experiences and may include positive and constructive elements as well as negative and destructive elements.

Moore (1981) led a research project to examine the process by which work experience participants organize their social interactions to make learning possible. The study involved interviews and observations at more than thirty resource sites. Moore concluded that variations between tasks and social arrangements to accomplish tasks were primarily a function of situational factors unrelated to a reasoned choice of pedagogical strategy. His research found the social means by which learning sequences took place varied considerably by situation. Students make learning strategy choices based on the social organization of the human, informational, and material resources available. There was no consistent relationship between the nature of tasks to be accomplished and social processes students used to accomplish tasks. As a result, he realized that the effectiveness of students' learning strategies depended upon a "host of extra-pedagogical factors embedded in the broader institutional context" (p. 296). Among these factors were individual characteristics of the participants such as cognitive style, assertiveness and initiative, personal experience background, and compatibility of personalities.

Complexity of Cooperative Work Experience

For CWE students, learning on a work site is complicated. Students must adapt quickly to several roles, all of which may be new to them. At the same time they are trying to fulfill learning objectives from their college curriculum, they also

must adapt to new work settings (organizational socialization) and learn skills, behaviors, and attitudes of a new profession (occupational socialization). Attitudes of employees toward student workers may further complicate CWE environments. Employee attitudes may range from eagerness to make students feel welcome and share knowledge and techniques to open resentment or isolation (Stasz and Stern, 1998). To benefit from these complex situations, CWE students use a variety of strategies to learn from the opportunities each unique work situation offers. Given this situation, and the temporary nature of most CWE assignments, students need to have and use attitudes, behaviors, and social skills that enable them to adapt quickly to new work settings and effectively interact with and learn from trainers, supervisors, and other employees.

Purpose of the Study

The purpose of this study is to identify and describe social and learning strategies male community college students use to maximize learning from cooperative work experiences. The study answers the following questions:

1. What learning strategies should students use to take maximum advantage of the learning opportunities available during their workplace experiences?
2. How do students recognize work site learning opportunities?
3. Are there specific attitudes and behaviors students should have and demonstrate to be accepted by their CWE trainers and other employees?

Significance of the Study

By presenting a composite description of effective social and learning strategies based on data from students and trainers, the results of this study can be used to prepare students better for work experiences. Although this study focused on five professional/technical programs, CWE advisors and program managers of other experiential programs should consider using this information to help students maximize their learning from experiences.

This study builds on previous research in self-directed learning, workplace learning, and incidental learning, and shows connections among them. It adds to the body of knowledge about CWE by connecting social and learning strategies students actually use to theories such as cognitive apprenticeship, incidental learning, and practice. By including strategies perceived as effective by both students and trainers/supervisors, the research identified critical information for students, program instructors, and CWE advisors. This information can help students select and adjust social and learning strategies in order to take maximum advantage of the experiential learning opportunities of a cooperative work experience.

Overview of Methodology

This research was conducted at a medium-size community college in southern Oregon. The populations were worksite trainers and professional/technical students who had recently completed the CWE component of their program. The researcher conducted in-depth, open-ended interviews with samples from these two

populations. The study focused on male students in traditionally male programs—Automotive Technology, Diesel Technology, Electronics Technology, Welding Technology, and Construction Technology.

Program CWE advisors recommended subjects from both populations. All of the subjects participated voluntarily. In collaboration with the researcher, CWE advisors selected students who had completed a successful CWE experience. A successful experience was defined as having fulfilled the program requirements (completed the required number of hours and achieved the learning objectives) and, in the judgment of the CWE advisor, had a good learning experience. In all cases, students either had completed their programs or were in the final term. Advisors also recommended worksite trainers and supervisors who the advisors believed provided better than average learning situations for students.

All of the trainer interviews took place at their work sites. Conducting interviews on-site enabled the researcher to more effectively gain the confidence of the interviewees since they were in familiar settings and did not have to adjust to different environments for the interviews. Site visits enabled the researcher to observe actual student work situations and provided contextual background information about work environments. Student interviews took place either on a work site or at the college CWE office. Since students were familiar with both, interview location seemed less important to them. Given a choice for convenience, several opted to meet at the college. All of the interviews were open-ended. A set of topical questions developed by the researcher served to guide the interviews

(Appendixes B and C). This format enabled the researcher to probe for additional information and to further explore comments made by interviewees.

After the interviews with students and trainers were completed, a focus group was conducted with the CWE advisors of the participating programs. The purpose of the focus group was to inform the advisors of the findings and provide an opportunity for them to assess the validity of the researcher's observations and conclusions. Additionally, the focus group participants added information and opinions about the data and confirmed the accuracy of the findings. It also served as a method for determining if further research was necessary. Comments or observations about topics or subjects not revealed by the field research would have indicated need for further study. As a result of the focus group, information regarding liability was added to a trainer's comments about remaining after business hours to complete projects. Advisors also placed greater emphasis on safe work environments than did either students or trainers.

Delimits of the Research

Population Characteristics

The student population for this research was males who completed CWE's during the 1999-2000 academic year in traditionally male programs. The programs included Automotive Technology, Diesel Technology, Construction Technology, Electronics Technology, and Industrial Welding Technology. The total population was 56 students. Although other characteristics could have been used to further

differentiate among participants such as gender, age, ethnic origin, previous work experience, or learning style, the researcher determined that further differentiation was not necessary to achieve the purpose of the study.

Program Characteristics

The CWE program at the college where the study was conducted is operated primarily by the departments with administrative oversight by a central CWE office. Each department has its own procedures and methods for preparing students for CWE, selecting work sites, assigning students, developing learning objectives, and evaluating outcomes. None of the programs convene seminars for CWE students to reflect on their experiences during the course of their work assignments. Student evaluations by trainers at the end of each work experience are informal and, in some cases, did not occur. None of the trainers or supervisors interviewed received remuneration from the college for providing training.

Sample Size

Ten students and 14 trainers were interviewed. Data from interviews were analyzed during the course of the field research. Interviews were conducted until content of the comments by students and trainers became redundant to previous interviews. After the interviews were completed, a focus group with CWE advisors provided a review of the data from another perspective that served to check both the content validity and completeness of the data.

Researcher's Credibility

As an administrator at the college where the study was conducted, the researcher's position could have affected the willingness of some students to share feelings and provide frank descriptions. However, as a white male dressed in casual work clothes similar to those worn by technicians in the field and by using language similar to the respondents, the researcher did not detect reluctance to provide actual perceptions by the participants.

Researcher Qualification

The researcher has an undergraduate degree in Sociology, a Master's degree in public administration, and has received training in and previously conducted open-ended interviews. Additionally, the researcher has held numerous human relations and supervisory positions during a career of more than thirty years. During that time he has conducted hundreds of interviews pertaining to a wide range of personnel actions and issues. The combination of training and experience make the researcher eminently qualified to conduct interviews and make observations.

Definition of Terms

Cooperative work experience. Ryder (1987, p. 2) defined cooperative work experience as "experiential learning in which students engage in institutionally-sponsored productive work that is integrated into students' academic program curriculum." In a typical cooperative work experience, students spend periods of

time engaged in productive work related to their field of study where they can immediately practice skills and apply principles and theories learned in the classroom. According to Wilson and Lyons (1961, p. 66-68) cooperative work experience has the following objectives:

1. Furnishes students with vocational guidance.
2. Assists students to develop skills in the application of theory, principles, and concepts to real problems.
3. Assists students in developing personal independence and sense of responsibility.
4. Assists students in developing attitudes and skills conducive to effective interpersonal relationships.
5. Gives students an orientation to the world of work.
6. Helps students to develop a greater appreciation of the value of education and increase motivation for education.
7. Affords students a wider range of opportunities for cultural development.

Informal learning. “Any workplace learning in which the process through which workers learn is neither determined nor designed by the organization, regardless of the goals toward which the learning is directed, or the setting or activities in which learning occurs” (Center for Workforce Development, 1998, p. 16).

Incidental learning. “A spontaneous action or transaction, the intention of which is task accomplishment, but which serendipitously increases particular knowledge, skills, or understanding. It includes such things as learning from mistakes, learning by doing, learning through networking, learning from a series of interpersonal experiments” (Ross-Gordon and Dowling, 1995, p. 315).

Learning strategy. “The cognitive techniques or skills an individual elects to use in order to accomplish a specific learning task. Learning strategies differ from learning style in that they are techniques rather than stable traits and they are selected for a specific task” (Conti and Fellenz, 1991, p. 2).

Occupational socialization. Occupational socialization is the process of acquiring the values, behavior expectations, and skills that may be generalized across organizational settings in which the occupation is practiced (Fisher, 1986).

Organizational socialization. Organizational socialization is learning accepted norms and attitudes for a specific organization, how to function within a work group, to do a specific job, and about self in the context of the job being performed (Fisher, 1986).

Social strategies. As defined by the researcher, social strategies are those attitudes, behaviors, and personal communication techniques people use to interact

with others in a given environment. Setting, purpose of the interaction, and relationship to other people involved influence strategy selection.

Tacit knowledge. Tacit knowledge is practical know-how subconsciously learned from experience. It includes inferences and understandings a person has but cannot tell how they were acquired such as face recognition (Williams et al., 1993; Polanyi, 1966). It is the practical, “common sense” rather than academic, informal rather than formal, and implicit rather than taught knowledge that one generally learns through experience on the job (Williams et al., 1993).

CHAPTER 2

LITERATURE REVIEW

Overview

Cooperative work experiences (CWE) are complex experiential learning situations that require students to simultaneously adapt to several roles. While at their work sites CWE students learn continuously, consciously and tacitly, as they interact with supervisors, trainers, other employees, and customers. Some of their conscious learning is structured around specific curricular outcomes, but they also learn informally and tacitly through the everyday activities of being at a work site. At the same time CWE students strive to fulfill learning objectives for their college program curricula, they must adapt to new work settings (organizational socialization) and learn skills, knowledge and attitudes of a new profession (occupational socialization). They also have to analyze and adapt to the personal characteristics of members of their work groups and their trainers. Differences in learning styles, levels of motivation and attention, attitudes toward the work environment and other employees, and personalities can affect the efficiency of students' learning and their adaptation to work settings. Attitudes of employees at work sites toward student workers may complicate CWE situations. Employee attitudes may range from eagerness to make students feel welcome and share knowledge to resentment and isolation (Stasz and Stern, 1998). The combination of learning new roles for themselves and adapting to new work groups with unique characteristics and

attitudes creates a challenging environment for students. To adjust to and learn from these complex situations, CWE students must use a variety of social and learning strategies to make the most of work site learning opportunities.

This chapter provides an overview of previous research on cooperative work experience and reviews literature for four areas pertaining to social and learning strategies students use to maximize their experiential learning from CWE.

1. Categories of learning.
2. Experiential learning in the workplace.
3. Socialization processes.
4. Learning strategies.

Previous Research on Cooperative Education

In general, recent cooperative education research has focused on programmatic issues and impacts of CWE on participants and employers but has not thoroughly investigated the actual processes by which students learn from and are transformed by the experience. Bartkus and Stull (1997) observed,

Most of the research (regarding cooperative education) completed over the last 30 plus years is probably best described as applied descriptive and evaluative in scope. It has also been largely pragmatic in nature without a strong theoretical underpinning. Most of the past research in cooperative education has focused on such issues as program development, administrative practices, benefits to co-op partnerships, attitudes toward co-op, program outcomes, and the impact of co-op participation on students, graduates, and employers (p. 9-10).

Focus on Structure

Researchers have reviewed the structure of CWE programs and impacts of work experience on students' future employment. Other studies have focused on connections between academic and experiential learning outcomes to justify cooperative education as an academic discipline (Wilson et al., 1996). Wilson (1997) grouped recent cooperative education research reports under topical headings such as the merits of CWE for students and graduates, goals and expectations of employers, characteristics and skills needed by program coordinators, and the characteristics of co-op programs and how they are developed. (p. 20). By omission these groupings confirm a lack of research emphasis on how students learn during work experiences.

Focus on Outcomes

Similarly, studies about students learning from cooperative work experiences tend to describe outcomes rather than processes. Fletcher (1989) noted that cooperative education research has focused on outcomes related to career development, career progress, and personal growth, and, while a number of outcomes have been identified, there has been little research on how students actually achieve these outcomes (p. 33). Stasz (1997) summarized research on work-based learning as consisting of case studies from reports by participants but with few studies based on actual observation of students at work. In an article on assessing the outcomes of cooperative education, Wilson (1989, p. 42-43) said, "In my view we rely too much

on student papers about their work experiences and on employer ratings in order to award credit and we spend too little effort finding out what students are really learning so that we can effectively guide them in their further learning efforts.”

To extend Ricks’ (1996) analogy that practitioners have been “too focused on building the house and not enough on the life experiences of living in the house” (p. 9), research regarding cooperative education tends to describe the house and the results of having been in the house but has not adequately examined what goes on inside the house.

This present study looks inside the house to examine student learning in the context of work environments. The research reported here identifies and describes social and learning strategies students need to gain the most benefits from their cooperative work experiences.

Categories of Learning

Workplace learning includes three interrelated categories of learning: (a) structured learning, (b) informal learning (including self-directed and incidental learning), and (c) tacit learning. The following discussion of these categories provides a framework for examining learning strategies CWE students used during their work experiences.

Structured Learning

While discussing the rationale for assessing the outcomes of instruction, Wilson (1989) declared, “Learning proceeds most effectively when there are clear objectives to be achieved and learning experiences designed to aid their achievement” (p. 38). For CWE students, structured learning consists of those activities specifically designed and conducted to help them achieve learning outcomes required by their program to earn credit. Wilson (1989) and Whitaker (1989) described cooperative education as a structured instructional methodology where instructors or CWE program coordinators develop specific goals and objectives related to the curriculum which students are expected to accomplish through productive work. For structured learning, students know the outcomes expected from the learning experience, the activities involved, and the method for evaluating success. The key characteristic of structured learning is the set of specific outcomes for students to achieve.

Learning to Change Behaviors

Gagne (1985) defined learning as “a change in human disposition or capability that persists over a period of time and is not simply ascribable to processes of growth” (p. 2). Change refers to adjustments in behavior as a result of being in a learning situation. Behavior also includes attitudes, interests, or values. According to Gagne, learning is a set of internal processes that transform stimulations from the environment into forms of information leading to long-term memory and capabili-

ties for changes in behavior. Learning occurs when an event or stimulus, together with the person's memory, affects the learner in such a way that his or her performance changes. There are two general results from learning: associations of mental events and new or enhanced capabilities.

According to Gagne, careful planning is a prerequisite for learning. Planning must consider a student's capabilities before and after the experience as well as where to begin, and steps to follow to achieve the objectives. An instructor must arrange an external situation to stimulate, support, and maintain internal learning processes for individual learners.

Learning as Adults

Most cooperative work experiences include some structured learning components conducted by work site trainers, college instructors, or CWE coordinators. These components may, for example, include traditional classes pertaining to occupational skills or workplace rules and regulations, small group instruction about new equipment or policies, and short modules of on-site instruction regarding specific tasks. Regardless of the format, CWE students, as adult learners, tend to be pragmatic and focused. According to Knowles et al. (1998):

1. Adult students want to know why they need to learn something and how it will improve their effectiveness or the quality of their lives. They want to discover for themselves the gaps between what they know and don't know and what they need to know. With this background

information, they understand why they need to learn the new skill or behavior.

2. Adults believe they are responsible for their own lives and decisions. They need and expect others to treat them as being capable of self-direction. They resent situations where they feel others are imposing their wills on them.
3. Adults have accumulated an experiential history. Adults bring a wide variety of individual differences to a learning situation. They also may bring opinions and biases based on experience. It may be difficult for them to be open to new approaches.
4. Adults become ready to learn when they need to know something in order to cope or perform more effectively.
5. Adults are life-centered. They are motivated to learn to the extent they anticipate the learning will help them cope with real situations.
6. While adult students respond to external motivators such as better pay and promotions, they are more strongly motivated by internal motivators such as higher self-esteem, increased job satisfaction, and feeling of accomplishment.

Informal Learning

At the same time CWE students are achieving structured learning objectives, they are learning informally about job tasks, co-workers, organizations, and

their new occupations. Informal learning is “any workplace learning in which the process through which workers learn is neither determined nor designed by the organization, regardless of the goals toward which the learning is directed, or the setting or activities in which learning occurs” (Center for Workforce Development, 1998, p. 210). Rogers (1960, p. 69) observed, “The only learning which significantly influences behavior is self-discovered, self-appropriated learning. Such self-discovered learning, truth that has been personally appropriated and assimilated in experience, cannot be directly communicated to another.” For this present study, incidental and self-directed learning are considered sub-sets of informal learning.

A major study of informal learning by Center for Workforce Development (1998) demonstrated the significant role informal learning plays in the workplace by identifying, examining, and analyzing various ways informal learning occurs. The primary goal of the project was to “demonstrate empirically the significant role informal learning plays in the workplace” (p. 10). A research finding was a small, but statistically significant, positive relationship between informal learning and production performance. The study reported findings pertaining to motivation, setting, context, and content of informal workplace learning and recognized the constructed nature of informal learning. The researchers observed that informal learning is ubiquitous and surrounds every formal learning situation. The study looked at why and how informal learning occurs, what learning occurs, and contextual factors that impact informal learning.

Why Learning Occurs

The two primary drives for informal workplace learning are the need to meet organizational goals and a desire to fulfill individual goals. Individuals learn to achieve personal goals such as job security, promotion, esteem, and mastery. They also understand that learning for the benefit of their employers can benefit them. Organizations can promote informal learning by aligning business goals and the psychological and financial goals of their employees.

How Learning Occurs

Informal learning occurs during everyday activities when employees assemble for one-to-one conversations, meetings, team projects, shift changes, and meetings with customers. Learning also happens by design through on-the-job training, mentoring, cross-training, and site visits. Other sources for learning are doing the job itself, interactions with supervisors or trainers, documentation, and exploration.

What Learning Occurs

Informally acquired knowledge and skills can be grouped into four areas:

1. Pragmatic skills and knowledge to do a specific job.
2. Intrapersonal skills such as self-management, critical thinking, problem solving, performing under pressure, and learning from mistakes.

3. Interpersonal skills to work with teams, present ideas, ask questions, and develop effective working relationships.
4. Cultural development or the acquisition of skills and knowledge about the organization's culture and how to effectively balance individual and organizational expectations.

Contextual Factors

An organization's norms, beliefs, values, and practices determine the extent, variety, and quality of informal learning. Organizational practices such as official policies and practices, leadership styles, incentives, and symbols set a tone for communications and attitudes for employees. Social norms such as work habits, trust, cooperation, competitiveness, and morale are set by employees. Together, organizational practices and social norms create a culture that impacts the extent, variety, and effectiveness of informal learning.

This Center for Workforce Development study concluded most learning in organizations occurs informally in the course of everyday activities and in pursuits of larger organizational and individual goals.

Incidental Learning

“Perhaps the greatest of all pedagogical fallacies is the notion that a person learns only the particular thing he is studying at the time. Collateral learning in the way of formation of enduring attitudes, of likes and dislikes,

may be and often is much more important than the spelling lesson or lesson in geography or history that is learned” (Dewey, 1938/1997, p. 48).

Ross-Gordon and Dowling (1995) defined incidental learning as “a spontaneous action or transaction, the intention of which is task accomplishment, but which serendipitously increases particular knowledge, skills, or understanding. Incidental learning, then, includes such things as learning from mistakes, learning by doing, learning through networking, learning from a series of interpersonal experiments” (p. 315). Watkins and Marsick (1992) defined informal learning as learning from experience outside formally structured, institutionally sponsored, classroom-based learning. They defined incidental learning as largely unintentional and a by-product of some other activity. According to Lankard (1995) incidental learning is opportunistic—the unexamined and unanticipated by-product of some other activity. Discovery and curiosity are important aspects of incidental learning. A person discovers or learns while in the process of accomplishing a task and might not have reflected on or been aware learning took place. With incidental learning, there is no plan or learning objective, no evaluation of the learning, and a person does not consciously select the best way to learn or define the limits of the topic.

Self-Directed Learning

During work experiences, students have opportunities to consciously pursue learning outside of curricular objectives. This self-directed learning falls under the

broad definition of informal learning. Tough (1979) found that adults are motivated to keep growing and developing but their motivation is frequently blocked by barriers such as lack of opportunities, resources, time, or a negative self-concept about one's ability to learn. Tough studied processes adults use for self-directed learning and determined they used many of the same procedures instructors would have performed in structured learning situations. He also found self-directed adult learners access a variety of people for assistance, information, and guidance with their learning.

Purposeful learning

Knowles (1975) described self-directed learning as a process where adults take initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying resources, choosing and using appropriate learning strategies, and evaluating the outcomes of the process (p. 18). He concluded people who take initiative learn more and better than do passive learners. They tend to be more purposeful and motivated and feel more independent and responsible for their own lives. Knowles based his theory on assumptions that, as people mature, their experiences become increasingly rich resources for learning (p. 19-21). People grow in capacity to be self-directing and are ready to learn what is required to perform life tasks or to cope more adequately with life problems. The natural orientation for learning is task- or problem-centered and learning should be organized accordingly. He also assumed adults are motivated by needs for self-

esteem, desire to achieve, urge to grow, satisfaction of accomplishment, need to know something specific, and curiosity. Every person has a different pattern of readiness to learn.

Constructed knowledge

Brookfield (1985) asserted that learning activities of successful self-directed learners take place in social contexts and other people are the most important resources. He found self-directed learners choose peers, experts, and fellow learners as primary sources of information. Most information is transmitted orally in informal settings including spontaneous conversations. In one sense, every person is an independent learner who receives and codifies stimuli in an individually unique and idiosyncratic manner. Although some degree of direction and purpose is a necessary condition for education, learners can and do embark on intellectual quests with no specific, fixed, or terminal point in mind and with no real idea of how to design learning objectives to achieve a certain level of proficiency.

Brookfield (1985) described self-directed learning as a constructivist activity resulting in a change of consciousness. Techniques for self-directed learning include setting goals, locating resources, designing strategies, and evaluating progress, but actual self-directed learning is much broader and concerned with internal changes of consciousness more than external management of activities.

This consciousness involves an appreciation of the contextuality of knowledge and an awareness of the culturally constructed form of value frameworks, belief systems, and moral codes that influence behavior and the creation of social structures. ... This most fully

adult form of self-directed learning is one in which critical reflection on the contextual and contingent aspects of reality, the exploration of alternative perspectives and meaning systems, and the alteration of personal and social circumstances are all present.

He referred to self-directed learning as “a constructivist activity with a socio-political character” (p. 15).

Patterns of self-directed learning

Spear and Mocker’s (1984) research on self-directed learning did not find evidence that an individual consciously pre-plans informal settings but found evidence of a definite order, deliberateness, and logic in the process. They asked 158 persons to describe how they went about learning a particular subject. From their study, they noted learners did not consciously select information resources but were more likely to use a readily available single resource such as a book, friend, co-worker, etc. Typically, the impetus for learning was triggered by some change in life circumstances, and the individual’s life circumstances determine the structure, methods, resources, and conditions for learning. Spear and Mocker described four major patterns to self-directed learning:

1. *A single event with anticipated learning* such as a new job. From past experience people know they will be able to use resources available in the situation to acquire knowledge and skills needed to succeed.
2. *A single event with unanticipated learning* such as applying knowledge accumulated through observation and contact with others. This is

knowledge people do not expect to acquire, but, through circumstances, do achieve some level of proficiency.

3. *A series of related episodes* focused on a specific need or interest.

While the episodes may appear unrelated and sequences may be unanticipated, the combination of the episodes and sequences provides organizing circumstances.

4. *A series of unrelated events* through which an individual acquires seemingly random information with no special purpose. When the individual decides to learn a related skill, previously acquired information becomes the organizing factor.

These patterns take place within the parameters of a person's circumstances and provide context for learning. While learners may choose from a variety of options within their life circumstances, these same circumstances may also limit their options.

Tacit Learning/Practical Knowledge

Tacit knowledge is practical know-how learned from experience. Usually not openly expressed or stated, it is acquired in the absence of direct instruction (Wagner and Sternberg, 1985; Williams et al., 1993). Tacit knowledge is "common sense" rather than academic, informal rather than formal learning, and implicit rather than taught. It is knowledge one learns subconsciously from experience on the job. For Watkins and Marsick (1992), tacit knowledge resides in the

context and outside a person's main focus of attention. As such, it is especially susceptible to inaccurate assumptions, inferences, and judgments since these are not consciously examined.

Tacit Knowing

Polanyi (1966) explained tacit knowing as including more than a person can tell. Tacit knowing is the mechanism underlying the formation of a mental pattern or configuration from a spontaneous impression on the brain. As an example, a person can recognize the face of an acquaintance by knowing the combinations and characteristics of the features but not be able to specify those features. When looking at a face, an observer can identify a particular mood and attach a meaning to what is observed, but find it difficult to explain the subtle shifts in expression and their meaning in terms of the features and characteristics of the face. According to Polanyi, tacit knowing is the step between the introduction of an object or concept and its incorporation into the knowledge of the receiver. This knowledge comes from the receiver's inferences or implications from the action, object, or statement.

Practical Knowledge

Wagner and Sternberg (1985) expanded the concept of tacit knowing to include practical knowledge as the acquisition and use of tacit knowledge. In their 1985 research, they found measures of intelligence (IQ tests and school achieve-

ment tests) to be only moderately correlated with successful occupational performance. Their explanation of this lack of significant correlation was, “the intellectual demands of schooling are but a subset of the intellectual demands of real-world pursuits” (1985, p. 437). Success in a real-world setting requires more than academic intelligence; it requires “practically intelligent behavior” (1985, p. 437).

Wagner (1987) described tacit knowledge in terms of content, context, and orientation. He referred to *content* as knowledge a person acquires about managing oneself such as personal motivation. Content also includes knowledge about managing tasks of a job and managing or interactions with others. *Context* refers to the focus. Local context is knowledge immediately applicable to a specific task at hand while global context refers to a broader and long-range perspective. Wagner also identified two *orientations*: pragmatic, which focuses on a solution to a real problem or situation, and idealistic, which focuses on the best possible solution. As a result, he concluded the relationship between knowledge for judgment and making decisions and level of performance extends to include informal knowledge as well as formal knowledge.

Tacit Knowledge Through Experience

Williams et al. (1993) hypothesized that CWE students acquire more tacit knowledge as a result of their experiences than non-CWE students. Results showed CWE students had more tacit knowledge related to general understanding of the business world and showed greater knowledge of the kinds of personal strategies

effective in day-to-day work than non-CWE students. They also showed greater willingness to take on challenges presented in the work environment.

Almeida (1994) also showed co-op students demonstrated a greater increase in tacit knowledge than did non-CWE students. Expanding on Sternberg and Wagner's (1991) research, she sought to provide quantifiable evidence that students have more tacit knowledge as a result of participating in CWE. She found a significant difference in the levels of tacit knowledge between business majors participating in CWE and non-participants and concluded students' higher levels of tacit knowledge were the result of participating in CWE.

Experiential Learning in the Workplace

The principle of continuity of experience means that every experience both takes up something from those which have gone before and modifies in some way the quality of those which come after.

— Dewey, 1938/1997, p. 35

Learning during cooperative work experiences encompasses more than the specific tasks and activities assigned by instructors or program coordinators. CWE students on work sites learn consciously and tacitly about a wide range of life situations as they interact with employees who depend upon their work for a livelihood. Students learn effective and ineffective behaviors and attitudes pertinent to specific occupations and specific organizations. They create mental models to help

connect classroom activities to actual workplace applications (Center for Workforce Development, 1998). They continue to learn as they reflect on events and activities from their work situations and make connections between classroom, work, and other life experiences.

According to Watkins and Marsick (1992), workplace learning takes place in a social context and involves a social contract among individuals working together to achieve organizational goals. The knowledge employees acquire affects, explicitly and implicitly, shared norms, values, attitudes, and behavior patterns. The workplace context influences how employees define situations, decide courses of action, and interact with each other. At job sites, CWE students learn in the same context as regular employees. Their learning resources are the full gamut of life and work experiences and may include positive and constructive elements as well as negative and destructive elements.

In addressing learning in the workplace, Marsick (1987) observed most on-the-job training models emphasize job-related knowledge and skills but separate these from the rest of the worker's life. Training programs often focus on skills and knowledge as a means to correct personal deficiencies affecting production. However, according to Marsick, learning for organizational goals cannot be separated from personal growth. Effective training must consider the social unit or work group that influences a worker's actions and behavior and the individual's self-perception as to how they fit in with their work group. Resnick (1987) also found the most effective vocational programs involve socially shared intellectual

work, are organized around productive work, and prepare students to be adaptive learners. She suggested many programs are ineffective because they tend to borrow instructional forms from traditional classrooms that focus on general skills, individual performance, and symbolic thinking.

Constructing Knowledge

Cognitive theory (Ertmer and Newby, 1993) stresses the continuous acquisition of knowledge and mental structures and addresses how information is received, organized, stored, and retrieved from memory. A person acquires knowledge or learns when information is related to existing knowledge and stored in memory in an organized, meaningful way through the use of such cognitive strategies as sequencing, outlining, synthesizing, and mental mapping. Ertmer and Newby described learning and understanding as functions of how individuals create meaning from experiences. Learners do not acquire knowledge from the outside world; rather they build personal interpretations based on experiences, interactions with other people and their environment, and personal history. Novak and Gowin (1984, p. 4) said the construction of new knowledge begins with observations of events and objects through concepts we already possess. Knowledge constantly evolves from the context of experiences as the brain filters inputs from those experiences. A concept continually develops as new situations, meaning negotiations, and activities recast it in a more densely textured form. Memory is always under

construction as a cumulative history of interactions. This constructed learning always takes place in a culturally based context.

Candy (1991) described the way people learn and construct reality as a continuous interplay between experiences (events and ideas) and interpretation of those experiences based on existing mental schemas. Knowledge is “socially constructed and historically mediated” as individuals construct and modify a system of schemas from their experiences (p. 436). According to Candy, external features of social reality strongly influence an individual’s reality. These features may inhibit, constrain, or determine a person’s thinking and ability to act freely. Internally, a person has a coherent and logical belief system to guide behavior and provide a frame of reference. While people tend to be autonomous, autonomy assumes the willingness and ability to be introspective and self-aware. Wittrock (1979) also included the concept of autonomy in describing the complexity of learning through experience. While recognizing the importance of cognitive processes to instruction, his observation conveyed the inter-connectedness of learning.

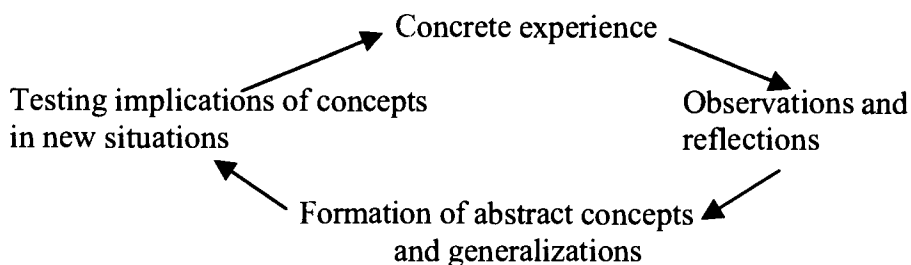
People learn not only by acting and experiencing the consequences of their actions but also by observing others, by imitating models, by watching television, by seeing a demonstration, by discussing issues, even by listening to a lecture; sometimes without practice, without reinforcement, and without overt action. Cognitive elaborations, such as inferences, images, memories and analogies influence their learning and understanding. Learners often construct meaning and create their own reality, rather than respond automatically to the sensory qualities of their environment (Wittrock, 1979, p. 5).

Learning from Experience

Kolb (1984, p. 29-31) described experiential learning as a holistic process involving the integrated function of the total organism including thinking, feeling, perceiving, and behaving. Learning occurs at points where expectations based on prior knowledge and present experience are not consistent. Kolb said learning is a continuous re-learning process where learners bring forth existing beliefs and theories for re-examination and testing. To learn effectively from experience, students must be able to involve themselves fully, openly, and without biases in new and concrete experiences and be able to observe and reflect on experiences from multiple perspectives. Learners must be able to integrate their observations into logically sound theories that combine experience with prior knowledge and use these theories to solve problems and make decisions.

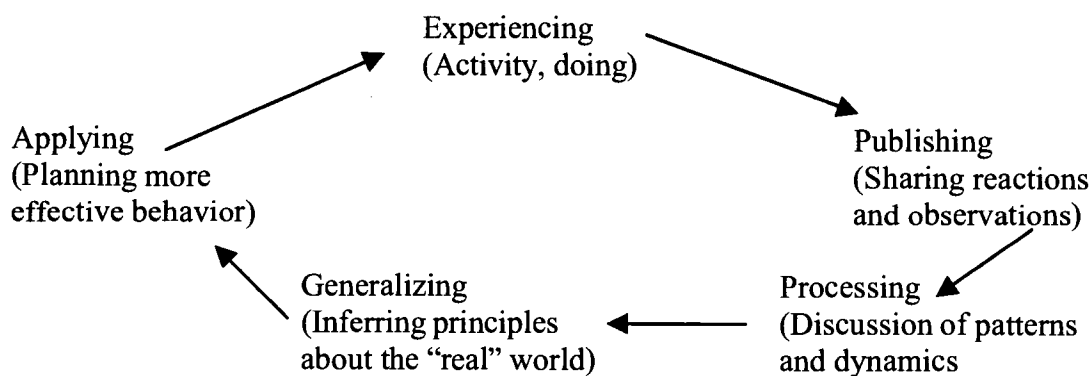
Kolb's experiential learning model provided a connection between experience and learning applicable to on-the-job learning. Since concrete experiences can be planned or unplanned, his model provided a theoretical basis for both planned and informal learning. According to Kolb, experiential learning integrates experience, perception, cognition, and behavior with emphasis on concrete experiences as means to test and validate abstract concepts. Feedback provides a basis for continuous evaluation of the consequences of action and to alter concepts and generalizations.

Figure 1. Kolb's experiential learning model



Pfeiffer (1988) offered a similar explanation of experiential learning as a five-step cycle. Focusing on learning in work situations, he expanded the observation and reflection stage of Kolb's theory to include a more public and active process.

Figure 2. Pfeiffer's experiential learning model



According to Pfeiffer, a process of Integration-Transfer-Reinforcement must become part of the person's way of operating.

Integration

New knowledge, attitudes, or skills must be put into a learner's frame of reference so they can become integrated into the learner's existing constructs and translated to his or her ways of thinking and behaving.

Transfer

The process of moving knowledge from the person's head to his or her real-life system, how it is applied and made to work in the person's environment. Planning for application and practicing are crucial steps in this process.

Reinforcement

The desired learning or behavior must be systematic. The person's environment must support and reward applied learning.

Learning is achieved through a combination of experience and cognitive understanding. Cognitive understanding of concepts is necessary for learners to sort experiences and place them into useful frames of reference. Theory and models provide frames of reference that give meaning to experiences and connect them to other realities. Pfeiffer concluded, "Experiential learning occurs when a person engages in some activity, looks back at the activity critically, abstracts some useful insights from the analysis, and puts the results to work through a change in behavior. Participants discover meaning for themselves and validate their own experience" (p. 204).

Classroom Learning Versus Experiential Learning

Coleman (1976) explained the difference between information assimilation that takes place in a classroom where information and knowledge are transmitted from the instructor to the learner and experiential learning outside of a classroom where individuals learn through acting or observing another person act and then experiencing or observing the consequences of that action. He identified four aspects of experiential learning: information assimilation, active learning, symbolic representation, and after action learning.

Information assimilation

Coleman described four steps to the information assimilation process. The first step is receiving information about a principle or specific examples of a principle, typically through a symbolic medium. The second step is assimilating and organizing the information so the general principle is understood. The student has learned the information when they understand the generalization rather than just committing it to memory.

The third step is being able to infer, through a cognitive process, a particular application based on the general principle. The fourth step is moving from cognitive and symbolic process to action or actual application.

Active learning

Experiential learning begins with action. A person acts and sees the effects of that action in a particular instance. At this point, the person has learned how to act in a particular circumstance. The next step is to understand the general principle as the basis for the particular circumstance and then apply the generalized principle through action to a new or different situation. This is different from the first step because the actor understands the underlying principle and can predict an anticipated outcome.

The process of information assimilation uses symbolic medium to relate to others' experiences. Through cognitive processes, people develop inferences from general principles as basis for action. In experiential learning, action precedes general principles. It has the advantage of having sequences of actions and consequences as well as cognitive processes to aid in mentally structuring information in memory. The associations and connections between action and the cognitive process of developing principles result in better retention than the primarily cognitive information assimilation process.

Symbolic representation

Experiential learning can occur without symbolic representation. While symbolic representation may be more efficient in some circumstances, it has limitations. Learners must know a complex system of symbols or language to understand concepts and communicate. Differences or defects in the associations each

person makes with the symbols or lack of knowledge of the language will limit a person's capability to learn. In addition to the limitations of language, a weak point in the information assimilation process is the transition from cognitive process to application. For experiential learning, students may have difficulty generalizing from specific instances.

After action learning

The motivation for experiential learning is based on exploring and understanding past action already impressed in the mind of the observer. The motivation to understand the connection between action and explanation is intrinsic. Symbolic medium may come into play for the steps following an action but is not essential to the learning process. For information assimilation, information comes from experiences and actions by others. The incentive to understand the application of a principle comes after the cognitive processes.

Coleman (1976) notes two distinct advantages of experiential learning. First, action, as distinct from passive receptivity, involves an investment of the self and motivation to perform successfully. Second, a successful action enhances self-assurance and sense of accomplishment.

Socialization Processes

When students begin cooperative work experiences, they enter challenging situations where they are both students and new employees in a new occupation.

As students, they have certain outcomes to achieve to earn academic credit for their experiences. However, most employers also expect them to do productive work. These two outcomes may or may not be compatible.

Students beginning work experiences face two types of socialization processes: occupational and organizational. They must learn behavior norms and attitudes associated with a particular profession or occupation. They also have to learn behavior norms and attitudes for being an accepted member of a specific organization. Both of these socialization processes are situational. For example, the organizational setting for a hospital nurse is very different from a school nurse; but, in both cases, there are occupational behaviors and attitudes appropriate for being a nurse. A hospital organization and a school organization are entirely different environments and operate with different expectations and rules. CWE students must learn how to become a member of an occupation or profession as well as to be a productive member of an organization.

Occupational Socialization

Coffey and Atkinson (1994) described occupational socialization as the manner by which professional knowledge and culture are created, reproduced, and transmitted to new recruits in an occupational setting. This socialization recognizes the situational and contextual nature of occupational practices and perspectives. Pithouse (1994) described it as learning the ethos of shared assumptions for the

behaviors and attitudes members of an occupation recognize as indicating competence.

Assumed Competence

In studying childcare social workers, Pithouse noted workers developed behavior patterns that supported each other and assumed competence. The case management nature of the work meant the social workers operated autonomously in an uncertain environment where measurement of impact was difficult. In spite of operating independently, they managed to construct shared reference points to validate and chart the course of their activities. They saw themselves as guardians of a mission generally beyond the comprehension of those not involved in day-to-day practices. Once a supervisor assigned cases to a new worker, there was little discussion about the caseworker's competence. The workers considered too much consultation with others as an indication of dependence and questionable competence. Hence, workers limited discussions about cases to a few individuals with complementary skills and abilities. The preferred occupational image for this group was a competent solo-practitioner operating in a personally supportive but professionally uncritical manner.

Situational Adaptations

Carter (1994) found prison officers developed personal behavior patterns for effectively interacting with prisoners. Official training for new officers taught

rigid compliance with rules and policies as the most effective way to control prisoners; but, when new officers began to work with experienced officers, they observed actual practices and then developed their own unique styles and coping strategies. Carter noted that learning the ethos of a new occupation is a dynamic and continuous process, sensitive to changes in environmental and occupational realities.

Status Hierarchy

In researching socialization processes for special education teachers, Todd (1994) noted that the relationship between job categories is another aspect of occupational socialization. Within the teaching occupation, different teaching responsibilities carry different status. Classroom teachers assigned less prestige to teachers of non-academic areas such as special education. Within an occupation, there are processes for exclusion as well as for inclusion.

Job Security Concerns

Darrah (1995) found more serious socialization issues than exclusion in a study of training in a computer assembly company. Employees were unwilling to share knowledge for fear of diminishing their value to the company. Within the organization, members of some occupations restricted information sharing in order to maintain power and control. New employees received minimal on-the-job

training and supervisors intentionally limited access to information about other functions and occupations within the organization.

Organizational Socialization

Louis (1980) described organizational socialization as “the process by which an individual comes to appreciate the values, abilities, expected behaviors, and social knowledge essential for assuming an organizational role and for participating as an organizational member” (p. 229-230). Van Maanen and Schein (1979) said organizational socialization is “the process by which an individual acquires the social knowledge and skills necessary to assume an organizational role” (p. 111). It “entails the learning of a cultural perspective that can be brought to bear on both commonplace and unusual matters going on in the workplace” (p. 112). Regardless of background or previous work history, persons entering new work situations will have some feelings of disorientation and sensory overload. They will find reality different from their *a priori* concepts of their work role but will learn and gain information from multiple sources. They may realize that socialization is an individual process regardless of the format or structure of orientation process.

Sources of Information

Ostroff and Kozlowski (1992) surveyed 151 engineering and management school graduates and confirmed that, as newcomers to organizations, they relied on a variety of sources of information. These sources of information varied in impor-

tance for gaining knowledge. The study assessed the amount and relevance of information newcomers gained from co-workers, supervisors, mentors, observations, experimentations, and publications or other written information. The researchers correlated this information with four domains to which newcomers must adapt: job tasks, personal role, work group, and organization. They concluded newcomers rely primarily on observation of others, followed by information from supervisors and coworkers. The focus of information acquisition is primarily on job tasks and role-related aspects. Observation and experimentation are the most useful sources of obtaining knowledge while information about tasks and roles from supervisors is most important for positive socialization. The results suggested newcomers who get most of their information from supervisors are more satisfied, committed, and well-adjusted over time. As far as actual knowledge, newcomers gathered information from role models but actual learning took place through a variety of observation and experimentation strategies.

Socialization Activities

Miller and Jablin (1987, p. 3) identified seven kinds of activities newcomers use to learn about work environments. Newcomers may use (a) direct questioning, (b) indirect questioning, or (c) question a third party. They may (d) test limits by deviating from norms in order to gain more understanding about work and relationships. They may use (e) disguised conversations or open-ended discussion about a subject in order to acquire either general or specific information. Newcomers also

(f) observe specific issues and activities and (g) use surveillance strategies to scan the landscape regarding broader and more general issues.

Socialization Boundaries

Van Maanen and Schein (1979) identified three types of boundaries new people in organizational transition must negotiate. *Hierarchical boundaries* are associated with notions of merit or readiness to move to a different level in the organization. *Functional boundaries* are based on skills and aptitude. *Inclusionary boundaries* are those judgments others make regarding a person fitness for membership in the organization. The more of these boundaries a person crosses at one time, the more profound his or her experiences are likely to be.

Van Maanen and Schein (1979) also described socialization processes as a continuum between custodianship and innovation. At the custodial end of the continuum, the socialization process works to educate the newcomer to assume existing roles and accept the status quo. At the innovative end, the process signals to the newcomer that changes to the person's role in the organization, content of the position, or manner in which he or she performs the functions of the job are acceptable. The difference between the goal of socialization and a person's prior concept of themselves in the position is a source of potential frustration and anxiety about the appropriateness of the person-to-job match.

Acculturation Aspects

Louis (1990) reviewed acculturation as an essential part of role transitions. Becoming an accepted member of an organization requires a newcomer to gain an appreciation for what is normal in the work setting and for the shared but tacit meanings through which members interpret, express, and act in a setting. Louis identified four agents who contribute to the information a person acquires: peers, supervisors, mentors, and customers. Of these, peers have the most credibility and impact on newcomers. Interaction with peers is most common and influential because of physical proximity and task interdependence. These interactions help newcomers to learn and acquire norms, values, shared attitudes, and a sense of self necessary to move toward acceptance into the workgroup. Interacting with a group of peers as multiple sources of information is an advantage over depending upon the single perspective of an individual person. Mentors are similar to individual peers except they typically offer broader perspectives about the organization and its culture. They may help a newcomer to understand his or her relationship to the larger organization. Supervisors provide official information and values but may not have the credibility of peers intimately involved in the operation. Interactions with customers can also provide information about values and acceptable behaviors to newcomers.

Interactive Process

Acculturation is an interactive process and the personality characteristics of newcomers are likely to lead to certain information-seeking strategies (Louis, 1990). Newcomers with higher self-esteem and experience in making transitions are more likely to use overt questioning strategies. Also, the more similarities between new and previous environments, the more likely newcomers are to use overt strategies.

Louis (1980) listed three aspects of transitioning to new work situations: change, contrast, and surprise. Change refers to adjustments a new person must make to different working conditions, different status, and role identity. Contrasts are those settings and characteristics of a new position different from previous positions. They may require or result in personal changes. The third aspect is surprise or unanticipated differences, either conscious or tacit, between expectations and reality. Louis suggested these aspects are challenging for new employees because they require conscious thought. In familiar environments, established norms, habits, and schema guide most of a person's activities. In new situations, these are not established and available to guide behaviors. Newcomers must develop these in order to make sense of unfamiliar events. Past experience and personal characteristics including predispositions and motivation provide bases for making sense and establishing new patterns and habits to guide behavior.

Categories of Organizational Socialization

Fisher (1986) identified four primary content categories of organizational socialization and noted that newcomers must learn the priorities for each of these areas and from whom and how one can learn for each of these categories. In some instances, one or more mentors may help; but, in other situations, newcomers may have to seek out assistance on their own.

Organizational values, goals, and culture

These are the personality of an organization. According to Louis (1980), they convey important assumptions and norms that provide structures of meaning upon which employees can base decisions about behavior. They are enacted rather than spoken. An organization's values and culture come from attitudes and behaviors its members exhibit toward each other and groups, both internal and external. Stories and traditions reveal important organizational characteristics and behavioral norms. While many organizational values and culture may not be spoken or written, they are aspects a newcomer must learn either informally or tacitly. Other aspects such as reporting relationships, stated goals, pay and benefits systems, and other organizational systems are more formally structured and accessible. The manner in which an organization supports newcomers is, in itself, an aspect of its culture.

Work groups

Newcomers must learn the culture of their particular work group. This culture may or may not be the same as the organization's culture. A new person must learn the formal and informal power hierarchy and communication patterns, group politics, work habits and expectations, behavior patterns and norms, and how to get along with co-workers and the supervisor. There may be some initiation rite or hazing required before a new person is accepted into a work group.

The job

Every job has unique tasks and conditions. A new job requires newcomers to learn rules, procedures, standards, expectations, critical elements, and physical skills. Newcomers develop routines and learn parameters for making decisions so they can perform basic job requirements as they develop expertise. They also must learn how their jobs fit into the organization's production scheme and identify other functions that depend upon their particular job and the quality of their work.

Wanous and Collela (1989) cited two studies (Berlew and Hall, 1966; Bray et al., 1974) regarding work standards. New employees given difficult initial job assignments tended to develop higher work standards. These standards continued throughout their careers and resulted in higher performance and more rapid promotions. This tendency to internalize higher work standards was mitigated by the type of feedback the new employee received. Wanous and Collela also reported that, in

general, new employees are willing and motivated to change personal attitudes in order to be accepted by the organization.

Personal learning

Once on a job, new employees may find the realities of their work situations do not match their personal expectations and desires. The self-images they had prior to beginning work might not be accurate and may require adjustments. They may find aspects of the job more challenging and frustrating than anticipated or may discover talents to be more effective than expected. Areas where these organizational realities do not match an individual's needs, values, and expectations require adjustments that can have a long-term effect on a newcomer's motivation, performance, and job satisfaction. To be successful newcomers have to evaluate their new situations and decide on changes to make.

Priorities for Socialization

Newcomers also have to determine priorities for socialization (Fisher, 1986). Depending upon cues they receive, they may need to concentrate on learning how to do the job first because others depend upon its production. In other situations, understanding co-workers work habits and responsibilities may be necessary before new employees can determine their role or fit in the organization. New employees must learn who to ask to resolve conflicting guidance and information.

Fisher described *anticipatory socialization* as the knowledge that prepares, either functionally or dysfunctionally, new employees to enter an organization. This is the information upon which people base their expectations about a job and self-image of themselves in that work setting. This socialization includes both occupational and organizational aspects and is fairly easily modified based upon new or more credible information. This process may have begun years earlier, even as a youngster envisioning a career as a firefighter, and affects a person's self-efficacy, expectations, motivation, perseverance, and level of anxiety.

Impact of Social Organization

Moore (1981) examined processes by which work experience participants organize their social interactions to make learning possible. Moore concluded variations between tasks and social arrangements to accomplish tasks were primarily a function of situational factors unrelated to a reasoned choice of pedagogical strategy. His research found the social means by which learning sequences took place varied considerably by situation. Students make learning strategy choices based on the social organization of the human, informational, and material resources available. He found no consistent relationship between the nature of tasks to be accomplished and the social processes students used to accomplish tasks. As a result, he realized the effectiveness of students' learning strategies depended upon a "host of extra-pedagogical factors embedded in the broader institutional context" (p. 296). Among these factors were individual characteristics of the participants

such as cognitive style, assertiveness and initiative, personal experience, and compatibility of personalities. Moore abandoned his original purpose and focused his attention on analyzing features of learning environments after recognizing an almost infinite number of combinations of personal characteristics, environments, learning contexts, and the difficulty of identifying and examining cognitive processes in natural settings.

Learning Strategies

Conti and Fellenz (1991, p. 2) defined learning strategies as “the techniques or skills that an individual elects to use in order to accomplish a specific learning task. Learning strategies differ from learning style in that they are techniques rather than stable traits and they are selected for a specific task.” Weinstein and Mayer (1986, p. 315) described learning strategies as “behaviors and thoughts that a learner engages in during learning and that are intended to influence the learner’s encoding process.” The goal of a learning strategy is to affect the way the learner selects, acquires, organizes, or integrates new knowledge.

According to Brookfield (1985), every person learns in an individual and idiosyncratic manner. Wittrock (1979) contended learning with understanding is a personal discovery process. Even when given information to learn, students must individually discover its meaning. Students have individualized cognitive processes to understand information by testing it, applying it, drawing inferences from it, and relating it to other information and experiences. In this process students use

attention and motivation mechanisms as well as memory and information processing strategies to organize and understand information. Vygotsky (1933/1978), as cited by Jaramillo (1996), also claims learning takes place within the individual. Learners must experience concepts and then negotiate the meaning of those concepts in the social context of the culture and environment (Jaramillo, 1996). A learner develops his or her own interpretation or sense of the activity through a communication process with others.

Smith (1983) identified self-awareness as a requisite for learning how to learn. Self-knowledge of one's internal information processing preferences, emotions, levels of motivation and attention, and external strengths and weaknesses such as capability to access resources and reading and listening abilities are essential to learning. Smith emphasized self-awareness and the ability to self-evaluate processes and techniques that work and do not work as crucial to learning. This self-knowledge may affect choices and patterns of learning strategies students select.

Since every work setting is unique and each individual is different, the experiences and outcomes for each CWE student are different. Learning on the job means learning independently in the context of a work setting. For students, this means being responsible for their own learning during their work experiences. Knowles (1975) referred to this as a self-directed learning process where individuals, on their own initiative and with or without the help of others, determine their own learning goals, identify resources, choose learning strategies, and evaluate out-

comes. Brookfield (1985) added the ability to use external sources in a social setting to the description of successful self-directed learners. Candy (1991) observed that strategies learners use depend upon their perspectives and constructs about a situation. Personal significance determines the quality and amount learned.

The learning activities of successful self-directed learners are placed within a social context, and other people are cited as the most important learning resource. Peers and fellow learners provide information, serve as skill models, and act as reinforcers of learning and as counselors at time of crisis. Successful self-directed learners appear to be highly aware of context in the sense that they place their learning with a social setting in which the advice, information, and skill modeling provided by other learners are crucial conditions for successful learning (Candy, 1991, p. 9).

According to Novak and Gowin (1984), education provides learners with a basis for understanding why and how new knowledge is related to what they already know. To learn meaningfully, individuals must relate new knowledge to relevant concepts and propositions they already know.

Categorical Learning Strategies

Weinstein (1982) identified three categories of learning strategies students use to take greater responsibility for their own learning and adapt a learning environment to fit their individual needs and goals.

Information processing strategies. These include methods to help manage knowledge acquisition, retention, and retrieval. These often require learners to create some type of symbolic construction related to previous knowledge or experience. An example is creating an analogy between known and new information.

Other examples are creating mental images, identifying logical relationships among component, drawing inferences, paraphrasing, and recalling related information.

Wittrock (1979) found constructive activities, especially imaging, are important to understanding concepts and organizing information in memory. An example of this category is Ausubel's (1978) concept of advanced organizers for learning.

Advanced organizers are schemata of concepts presented in advance of a study that serve as a basis for explaining, organizing, and integrating new information with existing knowledge.

Active study strategies. Active study involves using information processing strategies as part of an organized system for studying. These strategies include time management procedures, test taking skills, concentration management, and vocabulary development and focus on organizing a learning environment and procedures. Examples include taking notes, self-questioning, and repetition.

Self-management strategies. These are personal variables learners create and manage that affect their cognitive and emotional environment. High anxiety, poor concentration, and low motivation can affect learning. Self-management strategies help students handle these and focus their thought processes. Attention-directing activities such as self-talk help students focus on learning rather than internal or external environmental variables.

Weinstein and Mayer (1986) expanded on these three categories to provide more explanation of information processing strategies.

1. *Basic rehearsal strategies* such as repeating items on a list until they are committed to memory.
2. *Complex rehearsal strategies* such as repeating information aloud, copying, and underlining where learners pay particular attention to the important aspects of information and actively do something with it. Focusing on important parts helps learners transfer information into working memory.
3. *Basic elaboration strategies* such as using mental or drawn images to help make associations and relate groups or lists of information. An example is learning the parts of the brain by recalling a visual image. These strategies include tactile sensations to help make associations.
4. *Elaboration strategies for complex learning tasks* integrate new information with prior knowledge by using prior knowledge to organize or assimilate new information into working memory. Strategies include paraphrasing, summarizing, creating analogies, taking notes, and question and answer exercises.
5. *Organizing strategies for basic learning tasks* include clustering information into groups according to shared characteristics or attributes. These strategies require learners to actively manipulate information and cognitively work with each item to assign it to the sensible place in a larger organizational framework.

6. *Organizational strategies for complex learning* tasks require learners to actively select information and construct organizing frameworks. Outlining and diagramming to organize main ideas from a piece of prose or steps of a demonstration are examples. Networking is an organizational strategy where learners connect new information with more than one related organizing framework.
7. *Comprehension monitoring strategies* involve setting learning goals, assessing if the goals are being met, and changing strategies as necessary to achieve the goals. Examples of these strategies are developing pre-reading questions or mentally designing a series of tasks to be accomplished. These can also be used to evaluate if the material was learned or the tasks performed satisfactorily in relation to the original goal.
8. *Affective strategies* are those techniques learners use to focus their attention, maintain concentration, manage performance anxiety, establish and maintain motivation, and manage their time.

Strategies for Learning on the Job

According to Root-Bernstein and Root-Bernstein (2000), students learn and are creative by paying attention to feelings evoked by a situation or event, empathizing from a different perspective, using non-symbolic mental tools such as sensual imaging, tactile sensations, or visual thinking, making something and

drawing it from memory, and then translating this experience into language. This may involve using other disciplines such as dance to demonstrate movement of electrons. Students learn through creative mental tools such as imaging, abstracting, empathizing or play-acting, kinesthetic thinking, analogizing, and modeling.

Situated Learning

Brown et al. (1989) contend knowledge is the product of activity, context, and the culture in which it is developed (p. 32). People learn by using tools, mental and physical, for an authentic activity situated within a context derived from the culture where the activity occurs. According to McLellan (1996) using stories and narratives to transfer information and provide context and structure are examples of strategies for situated learning. He also identified other strategies that facilitate learning in an environmental context such as reflective thought, collaboration, cognitive apprenticeship, and coaching.

Critical Reflection

Dewey (1910/1991, p. 6.) defined reflective thought as the “Active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends.” He identified reflective thought as a state of perplexity and a process for resolving that perplexity by finding other facts to collaborate or nullify the original conclu-

sion. Reflective thought requires an individual to accept ambiguity while considering past experience and prior knowledge in light of new knowledge.

Mezirow's (1981) concept of perspective transformation followed Dewey's state of perplexity. He described perspective transformation as becoming aware of personal assumptions that constrain behaviors and relationships and reconstituting these assumptions to integrate other broader and more inclusive perspectives and experiences. These transformations can occur either through a sudden insight or a series of transitions. Mezirow identified five steps to a change in perspective:

1. a disorienting dilemma
2. self-examination
3. a critical assessment of internalized assumptions and recognition of inconsistencies from expectations
4. recognizing one's dilemma is shared and others have shared similar discontentment
5. exploring options for new ways of acting

Students critically reflect to understand workplaces as socio-technical systems and use this understanding to act constructively (Hamilton, 1990). In a study of apprenticeship programs in Germany, Hamilton observed that linking school with learning in a workplace through critical reflection on events in the workplace is very different from seeking the direct transfer of either job specific skills or general academic subjects from school to a workplace. When students collectively shared reflections on events in a workplace, their learning experience

continued and was enhanced. They acquired better observation and communication skills and became more inquisitive and analytical. Students had to find ways to test their impressions empirically and expose them to validation or disproof. Reflection became a process for mutual discovery as students learned from each other.

According to Marsick (1987, p. 21), "All learning does not call for the depth of analysis required by critical reflectivity. However, learning calls for some level of simple reflection, that is the regular examination of one's experience to assess its effectiveness. Reflection is not confined to the classroom. It takes place informally throughout daily activities and interaction." Critical reflection, as distinguished from simple reflection, involves making norms, values, and assumptions explicit and available for examination and review (Watkins and Marsick, 1992).

Collaborative Learning

McKinley (1983) called collaborative learning a method of socially reflective thought. Based on a premise that individuals rather than groups learn, collaborative learning is a discussion in which learners cooperate to identify and explore the nature and adequacy of each other's perceptions, opinions, and beliefs. A collaborative learning situation considers the emotional and mental activities of each learner. It gives participants opportunities to recognize, evaluate, analyze, and resolve discrepancies between new information and prior knowledge and get help from others in resolving internal mental and emotional conflicts. Earned trust among participants is essential for collaborative learning to be successful. In a

work setting, collaboration may be between a student and the student's trainer or one or more other employees. A trainer or another employee may guide a typical collaborative discussion in response to discoveries made by a student.

Modeling

According to Bandura (1975; 1976; 1978), human behavior patterns are transmitted, deliberately or inadvertently, through exposure to social models. By observing behaviors modeled by others, a person can learn new behavior patterns and the consequences of those behaviors without imitating the behavior. Through observation, a person acquires images of modeled behaviors that act as templates against which future actions can be compared. The mental organization of this information is probabilistic since it is affected by internal cognitive processes and a continuous reciprocal interaction between behavioral, cognitive, and environmental influences. Modeling involves four sub-processes:

1. *Attentional processes.* Exposing a person to a behavior does not guarantee learning. The observer must attend or pay attention to a behavior to be able to recognize and differentiate distinctive features of the behavior.
2. *Retentional processes.* When a person observes a modeled behavior but does not perform the behavior, the person must retain the behavior in a representational form, either verbal or by image. While modeling produces relatively enduring images of the sequence of behavior, most

cognitive processes are primarily verbal. Verbal coding of an event enables a behavior to become part of the cognitive process. The combination of image and verbal coding enhance the efficiency and retention of the modeled behavior.

3. *Motoric reproduction processes.* This involves using symbolic representations to guide overt behaviors or rehearsal of a behavior. This is different from direct modeling in that the behavior is based on an internal symbolic representation rather than actual external events.
4. *Reinforcement and motivational processes.* Learned behaviors will not be performed if the observer saw negative incentives as a result of the behavior. Conversely, positive incentives will prompt replication of the behavior. Perceived higher levels of competence, status, power, and prestige of a model will result in stronger modeling as opposed to the impressions made by models of subordinate status.

Louis (1990) identified modeling as the primary method newcomers use during organizational socialization. Newcomers commonly model standards, values, and behaviors of the members of their peer group. While initial information may focus on task procedures, over time modeling is the primary method to learn behaviors and attitudes. The effects of modeling may enhance self-efficacy as a newcomer alters performance and behavior toward those modeled by peer group members.

Cognitive Apprenticeship

Duncan (1996) described cognitive apprenticeship as an instructional process where an expert models an activity or process and verbalizes the cognitive processes involved in accomplishing the activity so students can understand the steps the expert takes to solve problems and make connections and relationships to other activities and sequences. As an expert describes thought processes and actions, explains reasons for actions, and verbalizes self-correcting steps, the expert is providing a verbal description of the mental processes used to solve a problem. This verbalization of thought processes is the key component of cognitive apprenticeship. Through this process, the expert provides conceptual scaffolds or mental organizers students may use in their own task performance and efforts to solve problems. The expert then coaches and corrects as students work to solve similar problems. As students demonstrate increased competency, the expert gradually withdraws support.

From a student's perspective, cognitive apprenticeship combines several learning strategies (Cash et al., 1996). Students learn through observation reinforced by aural description of what they are observing. As they model behaviors and problem solving strategies, the conceptual scaffolds serve as advanced organizers for their thought processes. Articulating both what they are doing and thinking causes students to create mental images and scenarios that can be diagnosed and evaluated by an expert instructor. This becomes a reflective process for students as

they assimilate the feedback. This feedback helps students to develop new thoughts and clarify questions as a result of interactions with the expert.

Implications for CWE Students

Chickering (1976) described learning from experience as “learning that occurs when changes in judgments, feelings, knowledge, or skills result for a particular person from living through an event or events” (p. 63). CWE provides such experiences through structured and informal, self-directed learning in the context of a work setting. Cooperative work experiences require students to accomplish both explicit and implicit learning outcomes for specific program objectives and negotiate occupational and organizational socialization processes.

Foster (1986) summarized ten principles of learning based on educational psychology research and literature. While the intent of these principles was to enhance teachers’ effectiveness, the principles are basic to learning and, therefore, applicable to learning on the job. With the caveat that this is not an exhaustive list, he indicated the theorists to which each principle may be generally attributed.

1. People learn to do by doing, from direct or indirect instruction, from images of doing, and by observing others doing – Bandura/Gagne.
2. What a person did previously in similar situations can be good predictors of what he or she will do again, including the possibility that he or she will reason to alternative actions – Rychlak. One learns to do what one does, not something else – Guthrie.

3. Reinforcement can be important but is not necessary to learning. Reinforcement effects are often subtle, non-obvious, covert, and relative to the individual and the situation. The impact of reinforcement depends upon the value of the information to the learner. Information derived from an incorrect response promotes as much learning as does information about a correct response – Bandura/McKeachie/Nuttin.
4. Sequential readiness assumptions may hold for some simple tasks and for young children; however, adolescent and adult structures of knowledge and individual differences are often uneven and nonlinear. Readiness to learn is more dependent upon the nature of an individual's structure of knowledge than on developmental readiness. Advance organizers may create bridges to existing knowledge and non-linear thinking may be required to solve problems that would be unsolvable based on sequential readiness – Ausubel/DeBono.
5. A person's perceptions of self (including self-efficacy) and one's surrounding world (in dynamic interaction) influence every learning experience. A person's belief about his or her ability to perform certain behaviors influences how the person will perform the behaviors. The ways in which a learner perceives the world and makes sense out of the surroundings serve to determine whether learning occurs at all, or at surface or deeper, more meaningful levels – Bandura/Marton.

6. Rehearsal may aid learning, but it is often covert, occurring through imagery. Simultaneous activation of more than one brain center aids in generating learning. Activation of multiple brain centers, especially verbal, improves learning and retention – Pavio/Wittrock.
7. Transfer increases with task similarity and degree to which new learning may be anchored into a person's existing cognitive structure. Transfer may be vertical in a hierarchy of task complexity – Ausubel/Gagne.
8. Learning may be intentional or incidental and includes a differential ability to process information at surface and deep levels of meaning – Anderson/Marton/Rychlak.
9. Environmental incentives are differentially effective, depending upon personality factors such as learner (and teacher) anxiety; arousal, causal attributions, and self-efficacy – Bandura/Farley/Humphries and Revelle/Spielberger/Weiner.
10. Practice and meaningfulness enhance retention. Retention is achieved by a variety of means including imagery, metacognition, and generative processes – Flavell/Pavio/Wittrock.

Regardless of the quality of their preparation, CWE students learn in all of these ways. When a CWE coordinator arranges a work experience for a student, the coordinator knows the environment and has certain expectations about the quality and the content of the material the student will learn. But once a student is at a work site, the student becomes primarily a self-directed learner and determines,

to a great extent, what he or she will learn. Referring to the theories of Knowles, Brookfield, Spears and Mocker, this self-directed learning takes place in a social context, tends to be task or problem centered, but may involve an opportunistic intellectual quest with no specific or clearly defined objective in mind. According to the theories of Dewey, Candy, Ertmer and Newby, and others, this learning is constructed from the setting, the people and culture at the work site, and the student's personal characteristics and background. Students acquire practical know-how and common sense (Wagner and Sternberg, Watkins and Marsick) as well as developing intuitions and subconscious attitudes and knowledge (Polanyi). In addition to learning specific tasks, they also learn about becoming part of an occupation and an organization, understanding the culture of work groups and the organization, and how their personal skills and self-concept impact the learning process (Fisher and Louis). This present research seeks to identify and describe the strategies male CWE students use to learn while in a complex social workplace environment.

CHAPTER 3

METHODOLOGY

Cooperative work experience is a social learning situation where students learn through interacting and working with employees in an industrial or business setting (Center for Workforce Development, 1998). Ryder (1987, p. 2) described CWE as “experiential learning in which students engage in institutionally-sponsored productive work that is integrated into students’ academic program curriculum.” Most community college students arrange blocks of time for their CWE between classes, during days when they do not have classes, or during school vacation periods.

Learning on a work site is complicated. Given the limited duration of most CWE assignments, students must adapt quickly to several roles, all of which may be new to them. At the same time they are working to fulfill learning objectives for their college curriculum, they also must adapt to new work settings (organizational socialization) and learn skills, knowledge and attitudes of a new profession (occupational socialization). To gain the most benefits from their work experiences, students need to have and use attitudes, behaviors, and social strategies that enable them to quickly adapt to new work settings and effectively interact with trainers and supervisors.

Purpose of the Study

The purpose of this study is to identify and describe social and learning strategies male community college students use to maximize learning from cooperative work experiences. The study answers the following questions:

1. What learning strategies should students use to take maximum advantage of the learning opportunities available during their workplace experiences?
2. How do students recognize work site learning opportunities?
3. Are there specific attitudes and behaviors students should have and demonstrate to be accepted by their CWE trainers and other employees?

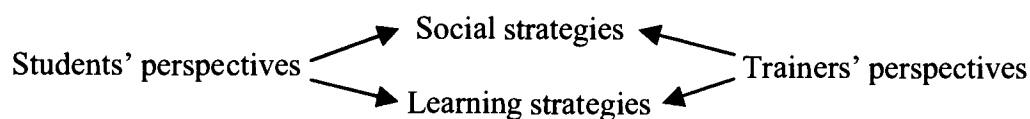
Methodology Challenges

Although the research questions focused on student strategies, learning from cooperative work experience involves two groups of people: trainers who are employees at the work sites and the students assigned to those work sites. While a survey of students could reveal the social and learning strategies they use on work sites, identifying effective strategies had to be done in the context of both those using the strategies (students) and those being impacted by those strategies (trainers). Therefore, the research method needed to consider both the students' and the trainers' perspectives.

Additionally, the research required a methodology that could examine both the relationships between students and trainers and the learning strategies students

used during their work experiences. The research method had to enable the researcher to identify specific student behaviors and attitudes that trainers perceived as expected and acceptable. Identifying learning strategies required a method that could synthesize perceptions by students who needed to access the trainer's knowledge and expertise and by trainers who agreed to provide the training.

Figure 3. Student and trainer perspectives



Methodology Considerations

Borg, Gall, & Gall (1993) stated that the purpose of qualitative research is to develop an understanding and appreciation of individuals and events in their natural state and take into account the relevant context. Based on the assumption that each individual, each culture, and each setting is unique, qualitative researchers discover “laws” for reliable predictions and control of phenomena. By contrast, the purpose of quantitative research is to make objective descriptions of a limited set of phenomena, search for pertinent variables and their relationships, and determine whether the phenomena can be controlled through certain interventions. A theory is formulated to account for the empirical findings.

The researcher considered both qualitative and quantitative methodologies and selected a qualitative method. A qualitative methodology was selected because

it enabled the researcher to interpret the perceptions of the subjects from their perspectives (Filstead, 1970; Bogdan and Taylor, 1975). Every CWE student, every trainer, and every work setting is unique. Therefore, an almost infinite number of combinations of environmental and personality variables can impact the relationships between student and trainers. A qualitative approach allowed the researcher to develop the analytical, conceptual, and categorical components of explanation from the data itself rather than from preconceived, structured *a priori* assumptions and theories. Qualitative research methods generate analytical categories and concepts grounded in perceptions rather than imposing an external pre-conceived framework (Brookfield, 1985). It is not intended to test hypotheses or determine causality (Dooley, 1995). For the purpose of this study, qualitative research to describe the phenomena in context and from the perspectives of the subjects (Borg et al., 1993) was appropriate to identify social and learning strategies used by CWE students.

Dooley (1995) advocated a qualitative approach when the purpose of the research is to explore or describe reality from the participants' point of view and when the natural setting provides the only or best location for research. The method selected enabled the researcher to produce descriptive data from the participants' own words and observable behaviors. These enabled the researcher to explore complex concepts whose essence could not be captured by other methods (Bogdan and Taylor, 1975). "The purpose (of the phenomenological research method) is to enter another's frame of reference in such a way that the learner's

structures of understanding and interpretation, and the perceptual filters through which the learner apprehends reality, can be experienced and understood by the researcher as closely as possible to the ways they are experienced and understood by the learner. Researchers become explorers of the topographies of learners' perceptual and interpretive terrains" (Brookfield, 1990, p. 330).

According to Brookfield (1990), qualitative studies are useful where there is no established research paradigm as is the case with learning to learn. They are flexible and adaptable and can accommodate a researcher immersed in a problem area. A researcher is able to change tack and try different approaches to and perspectives of the problem area. A rationale for qualitative research is predicated on the presumed inaccessibility, depth, and unconscious quality of the concept (Rousseau, 1990). Rousseau cites other researchers (Louis, 1983; Smircich, 1983) who argued that qualitative research is the appropriate methodology to study constructions of reality that are unique to the members of an organization when this uniqueness makes it impossible to use standardized measures to accurately describe the phenomena.

The researcher did not select a quantitative method because the study did not seek to prove hypotheses based upon manipulating variables. According to Borg et al. (1993) the purpose of quantitative research is to precisely describe a limited set of phenomena and determine if manipulation of certain variables produces effects on other variables. A goal of quantitative research is to discover relationships among variables in order to reliably predict and control phenomena.

Researchers seek to understand a complex phenomenon by analyzing its components and determining relationships among a limited number of the components. From analysis of data, researchers develop theories to account for empirical findings. Through statistical analysis of numerical data, research supports or does not support a specific relationship theory or hypothesis.

Carspecken (1996) observed quantitative research methods use variables that are abstractions from more primary assumptions about the human experience. Variables have to be objective and measurable, yet, according to Carspecken, many human experiences and actions are not quantifiable. Too often objective responses to a survey are taken to indicate nonobjective beliefs, values, and emotions. Quantitative research tends to stop short of tracing assumptions back to a theory of social action. Similarly, Dooley (1995) said quantitative social research seeks to understand general principles governing a set of specific events or experiences. It assumes an objective reality exists independent of the observer. This approach relies on numerical data convenient for summarizing results, assessing measurement reliability and validity, and testing inferences from samples.

Bogdan and Taylor (1975) pointed out that quantitative methods derive from positivist traditions of seeking facts or causes of social phenomena. Through empirical data, researchers can prove or disprove relationships between operationally defined variables. On the other hand, qualitative research seeks to understand human behavior from the actor's frame of reference. A qualitative method yields descriptive data that enable a researcher to see the phenomena as the subjects see it.

Reality becomes what the participants think, feel, and say it is (Dooley, 1995). External theories and preconceived hypotheses, constructs, and measures may hinder researchers in understanding participants' points of view.

Population and Sample

This research was conducted at a medium size community college in southern Oregon. The college offers professional/technical programs and courses, lower division transfer courses, developmental and remedial courses, and community and continuing education courses. It has two campuses to serve two major population centers and several small centers serving outlying areas within a two-county district. The population in the region is predominately Caucasian. According to the 2000 U.S. census, the largest minority population is Hispanic at six percent.

This study used purposeful sampling to identify information-rich, typical cases for in-depth study (Patton, 1990). A purposeful sample was appropriate for this study since the results may provide useful information to students, trainers, instructors, and advisors in these specific programs. According to Lincoln and Guba (1989), purposeful sampling is based on information considerations, not on statistical adequacy.

Student sample

The student population selected for this study was male students or recent graduates who had successfully completed cooperative work experiences in tradi-

tionally male occupations during the 1999-2000 academic year. In all cases, students either had completed their college programs or were in the final term. The programs for the study included Automotive Technology, Diesel Technology, Electronics Technology, Welding Technology, and Construction Technology. Fifty-six students completed a work experience during the year of the study. Ten of these were interviewed.

Supervisors/trainers sample

The second population was trainers and supervisors at the work sites where students completed their CWE's. A total number for this population could not be determined since the number fluctuated depending upon employers' production and labor force needs and willingness to provide training for students. A total of fourteen on-site trainers and supervisors were interviewed. Depending upon organizational structure, some students were trained by technicians who worked for a shop supervisor. In other instances, shop supervisors provided the training. Most trainers/supervisors had previously trained at least one other CWE student. In one instance, the supervisor was female and, in two cases, supervisors had trained female as well as male students. In all but three cases, one person served as both supervisor and trainer. In those three instances where different people filled these two roles, the researcher interviewed both the supervisor and the trainer. For this study, both shop supervisors and trainers are referred to as trainers unless specific comments need differentiation.

In most cases, students and trainers from the same work site were interviewed. However, the final number of trainers interviewed exceeded the total number of students. This difference was attributed to the lack of male students completing CWE in the welding program.

Table 1. Distribution of Participants

	Students	Trainers
Automotive technology	3	2
Construction technology	2	3
Diesel technology	4	6
Electronics technology	1	1
Welding technology*	0	2

*The welding program was in its second year of operation. Although several male students had been placed on work sites for training, the employers had hired them before completing their CWE's.

Role of CWE Program Advisors

Program advisors recommended students and on-site trainers for the study. All of the subjects participated voluntarily. In collaboration with the researcher, CWE advisors selected students who had successfully completed a successful CWE experience. A successful student experience was defined as having fulfilled program requirements (completed the required number of hours and achieved the learning objectives) and, in the judgment of the advisor, had a good learning

experience. Advisors also recommended on-site trainers who, in their judgments, provided good learning situations for students.

Arranging the Interviews

In all cases, the CWE advisors made initial contacts with students and trainers and provided a brief introduction for the researcher. They also advised participants that the researcher would contact them to set up interviews to talk about cooperative work experience. The researcher then contacted participants directly to arrange times and places for interviews. During this contact the researcher, using a conversation guide, explained that the research project was to help departments better prepare students for CWE and part of the interviewer's graduate research project. The researcher also provided an estimate as to the amount of time for the interview.

All of the trainer interviews took place on the work sites. Conducting interviews on-site enabled the researcher to more effectively gain the confidence of the interviewees since they were familiar with the setting and did not have to adjust to a different environment for the interviews. Site visits also enabled the researcher to observe actual student work situations. This provided important background information about work environments. In some cases, on-site interviews enabled participants to maintain control of their operations and keep their businesses open. The length of these interviews varied from about 40 minutes to an hour. Student interviews took place either on work sites or at the college CWE office. Since

students were familiar with both the college setting and the work site, the location of the interview seemed less important to them. Given a choice for convenience, about half opted to meet at the college. Most student interviews were 30 to 45 minutes in duration. In-depth interviews were conducted until no new information was being derived.

Interview Protocol

Spear and Mocker (1984) used open-ended and probing questions to identify learners' perceptions and recollections of actions that actually took place as they engaged in a self-directed learning activity. Interviewers asked subjects to start at the beginning and tell how they went about learning a particular subject. A purpose of these focused interviews was to discover factors impacting the way subjects organize and assimilate information when the information is beyond the consciousness of a learner. Boyd and Fales' study (as cited in Brookfield, 1990) used interviews to explore how people became aware of their own reflective learning patterns and how they consciously decided to use them. The purpose of these interviews was to cause subjects to reflect on the reflection process they consciously used.

Brookfield (1990) believed interviews provided an interactive exchange of perceptions when both parties are confident they can have a purposeful conversation that includes clarifications, elaborations, and explanations. Questioning should be invitational, open-ended, and stimulating to encourage subjects to talk freely and

spontaneously about their experiences and feelings. Brookfield said, “An important criterion by which the success of a phenomenological interview can be judged is the extent to which subjects feel they have gained some increased insight into their own actions as a result of participating in the interview” (p. 335). Students’ introspective responses considered the context of their experiences including social interactions, interpersonal relationships, and negotiations between students and employers and trainers.

The interviews for this present study began with introductions and a more detailed explanation of the purposes for the study. During the introduction, the researcher explained the study served two purposes: to collect information so college departments could better prepare students for cooperative work experiences, and as part of a graduate research project for the researcher. During this introduction, participants completed an informed consent statement (Appendix A) and the researcher asked permission to record the interview so he, the interviewer, could focus on the conversation instead of taking notes. None of the participants objected to the tape recorder.

Interview guides

While the interviews were informal and open-ended, the researcher used standardized sets of questions as interview guides. The questions, developed by the researcher, were different for students and trainers (Appendices B and C). The questions served as prompts to ask questions about a range of behaviors and

attitudes. This informal format enabled the researcher to probe for additional information and to further explore comments made by interviewees.

For interviews with trainers, the researcher began interviews with an eighteen-item questionnaire about work habits and attitudes. A primary purpose to this questionnaire was to focus the interview on social attitudes, behaviors, and learning processes and away from the technical preparedness of students. The researcher developed this questionnaire based upon his personal experience as a supervisor. Tabulation of the results of this questionnaire is at Appendix D.

During the interviews with trainers, there were two instances when both a shop supervisor and the student's trainer participated simultaneously. This provided an opportunity for them to stimulate thoughts from each other and to reinforce and qualify each other's comments. The presence of a supervisor might have inhibited comments by the trainer, but the researcher did not perceive any indication that this was the case. In one instance a shop supervisor and a trainer in the same shop were interviewed at separate times. This was a result of comments by a student as to the unique effectiveness of this particular trainer.

Vocabulary and dress

During the interviews, the researcher used language similar to that of the interviewees. The researcher's familiarity with maintenance work environments enabled him to use language that helped put the participants at ease. As a white male dressed in work clothes similar to those worn by employees, the researcher

did not detect reluctance to provide accurate perceptions from any of the participants.

Focus Group

After the interviews with students and trainers were completed, a focus group was conducted with the CWE advisors of the participating programs. Salant and Dillman (1994) recommend focus groups to stimulate people's thinking and to elicit ideas about a specific subject. While focus groups do not reveal information about proportions of the total population, they are appropriate to generate new perceptions and reflection on information.

The purpose of this focus group was to review the findings from the interviews and provide CWE advisors an opportunity to assess the validity of the researcher's observations and conclusions and add information and opinions about the data. It served as a method to confirm the accuracy of the findings and to determine if further research was necessary. Comments or observations about items or topics not revealed by the field research would have indicated a need for further study. The focus group provided additional information about liability issues to comments by a trainer regarding staying after business hours to complete projects. The CWE advisors also emphasized the importance of safe work environments more strongly than the supervisors and trainers did.

In preparation for the focus group meeting, the researcher provided each participant a written summary of the comments made by students and by trainers

(Appendices E and F) as well as copies of the questionnaires used during the interviews. The focus group met for two hours and the conversation was tape-recorded. Participants were also given a copy of the informed consent form and orally gave their consent to record and use their comments.

Validity of Research

Carspecken (1996) described validity as claims that the data or field reports accurately describe what occurred, analysis of the data was conducted correctly, and the conceptual basis for analysis was sound. Validity claims based on observations amount to claims that all other people making similar observations would agree with the statements made about the observed behavior. Differences or disagreements can be resolved by repeated observations, verifying understanding of common definitions or concepts, and discussion to achieve consensus.

Bogdan and Taylor (1975) expressed two concerns about the validity of qualitative research. The first was that the researcher acts as a selective filter of information and may include non-representative data. They point out that this is true of all research and is evidenced by sample selections, survey questions, etc. Qualitative researchers are conscious of these biases and use techniques to minimize their impacts. Filstead (1970) cited *a priori* assumptions and artificial schemes of explanation imposed on social reality as a serious validity problem for social quantitative research.

The second concern was that the presence of the researcher might elicit unrepresentative data. Awareness of possible impacts and distortions, techniques to minimize these, and carefully documenting procedures enable researchers to minimize impacts and permit readers to weigh this influence.

For this present research several techniques recommended by Carspecken (1996) enhanced the validity of this research. These are based on Lincoln and Guba's *Naturalistic Inquiry* (1989, Ch.11).

1. Multiple perspectives were used including interviews with students, interviews with trainers, a focus group with CWE advisors, and the researcher's observations.
2. Prolonged engagement through multiple interviews continued until comments by trainers and students became redundant.
3. The researcher used language similar to the respondents during the interviews.
4. The multiple perspectives of the interviews and a summative focus group provided opportunities for the researcher and others to check the accuracy of observations and inferences made by the researcher.
5. Interviews were conducted in familiar locations where the interviewees were comfortable.

Since each participant had unique personal characteristics and was in a unique setting, the data was analyzed comparatively among individuals. By viewing each participant individually, comparisons draw out similarities and differences

upon which to base findings. This comparison also built replication into the research (Glaser and Strauss, 1970).

Dooley (1995) cited inter-rater reliability as a difficulty for qualitative research conducted by an individual without the support of standard instruments or baseline criteria. Since the observer must use personal feelings, hunches, and intuition, the data is subject to rater biases. Two observers could arrive at different conclusions from the same settings. Given the possible impacts of the observer on the setting and observer biases, analysis must reflect on the ways the observer may have distorted the setting. Inter-rater reliability was not an issue for this present research since the researcher conducted the interviews. Impacts on the setting were minimized by the locations of the interviews, typically break rooms away from trainers and students usual workstations.

Data Analysis

Glaser and Strauss (1970) point out there is no sharp division between data collection and data analysis. Analysis begins as soon as observations begin and a researcher begins to form hypotheses. During the course of the field research for this study, data were analyzed after each interview and compared to previous data to identify common themes and new topics. The themes and patterns continually evolved during the course of the interviews. Interviews were conducted until comments by trainers and students revealed no new information to modify the core concepts that developed from the data.

Tapes from the interviews were transcribed for easier coding. As transcribed documents, interviews for each group of participants (students and trainers) were reviewed and coded by numbering sentences or group of sentences that pertained to a single thought or concept. In some cases, single sentences were numbered as a self-contained concept. More commonly a group of sentences within a paragraph or entire paragraphs were numbered. This coding system enabled the researcher to note the most common comments and return to actual participant comments more easily. As the interviews progressed several themes began to emerge and the researcher was able to merge and group concepts. For analysis, interviews were grouped by student comments and trainer comments. Within each of these groups, comments were categorized by themes related to research questions.

Observations About the Research Process

As the interviews progressed, two observations about the process became obvious. First, supervisors and trainers had much more input than students regarding the attitudes and behaviors students must exhibit to gain acceptance by trainers. The second observation was that transcribed documents do not convey accurately the levels of emphasis and enthusiasm for a concept or point revealed in face-to-face interviews. The non-verbal behaviors and voice inflections of trainers often conveyed much stronger feelings than the transcribed documents revealed.

These impressions as well as frequency were considered in analyzing the results of the interviews.

CHAPTER 4

RESEARCH DATA

This chapter reports the social and learning strategies CWE students and their trainers identified as important for students to maximize learning from cooperative work experiences. Data reported in this chapter are from interviews with students after they had completed a cooperative work experience, from the work site technicians who trained CWE students, and from a focus group with program CWE advisors after the interviews with students and trainers were completed.

In general, trainers had more to say and felt more strongly than students regarding attitudes and behaviors students should demonstrate. Transcriptions of the interviews with trainers do not adequately convey their enthusiasm and passion for their work as technicians and as trainers often revealed in the face-to-face interviews. The researcher considered these impressions in developing the findings that emerged from these data.

Student Interviews

Comments by students are organized according to attitudes and behaviors students believed important to successful cooperative work experiences and strategies they said they used to acquire knowledge and expertise.

Attitudes and Behaviors Students Believed Important to Successful Cooperative Work Experiences

Attitude toward work situations

All of the students interviewed had positive attitudes about their CWE situations. They attributed their attitudes to being and doing work in an environment they enjoyed and having opportunities to see actual applications for the principles they learned in class. First-hand experience enabled them to see working conditions and get to know people working in places similar to places they would likely work. Work experiences helped them to match their expectations with realities of occupations. Most students thought working at several different jobs within the same organization was preferable to a single job or changing organizations during their CWE. The following comments typify the attitudes of most students regarding their work situations.

I really enjoy this work. I really look forward now that I've decided what to focus on. Sometimes I feel guilty because they pay me for what I'm doing because I'm having so much fun doing it. I get paid for this. I should be paying them! (Student #1 interview, August 28, 2000)

I think my attitude toward (work as a diesel mechanic) has always been pretty good because I really enjoy it. I mean, I get to get dirty and its kind of like playing with toys but where you can make some decent money doing it, too. (Student interview, August 11, 2000)

The students in this study appreciated realistic exposure to work in their chosen occupation. While several students had previous work experience in their trade, for some students the CWE was their first exposure to the way businesses actually operate. For example, students learned that many diesel repair shops have

at least two shifts to meet the needs of truck drivers any time of day or night. An Electronics student also found himself working a swing shift. Automotive students saw first-hand the reality of working in a flat rate shop where technicians must balance between quality and speed since they are paid based on a pre-determined time allotment for a job regardless of how long the job takes. The following comments are typical observations students made about working in their occupations.

Be ready to work hard and work long hours. That's the nature of the business. There are very few places are you going to go work and they just go 9 to 5. You end up working 10 to 12 hours a day, but of course you get paid for it. (Student interview, August 11, 2000)

I'm starting to feel what it's like to work for them. See what my opportunities are there because, basically, there's a lot of people in the shop and obviously the people that have been there longer get the better work. I wouldn't say they have real good benefits; but, as far as the people who have been there a while, they do okay. Nobody expects to get rich or anything but the ones that have been on longer obviously make more money than the rest. I take all the work that nobody else wants. I'm trying to get in there and hopefully move up, but it's kinda like you move up gradually. It's going to be a while before I get to make any money like I was expecting. (Student #2 interview, August 28, 2000)

(In class) you can stand there and watch somebody do it and it doesn't really look that difficult. But you pick up that one-inch (pneumatic) gun in your hand and it's heavy and you start sweating and it's hard work. It's a lot different when you do it yourself. And then you understand a little better. (Student interview, August 11, 2000)

Students also valued opportunities to work in a variety of situations as means to increase their knowledge about an occupation. For example, a Construction Technology student spoke highly of his work assignment with a concrete test-

ing laboratory. At the time of the assignment, he was skeptical of its applicability; but afterwards realized the value of learning about a different facet of the construction industry. A Diesel Technology student appreciated working with a crane and lift dealership where he learned about electronics and hydraulics.

Motivation to learn and take advantage of learning opportunities

All of the students interviewed said motivation to learn and being curious were important. While students recognized work settings offered a variety of learning opportunities, most let their work assignments dictate the range of opportunities they pursued. Only a few students realized that workplaces offered a wide range of learning opportunities beyond the assigned tasks and immediate work area. Most did not comprehend the concept or take advantage of incidental learning opportunities. One student who did look for opportunities talked about his sharp upward learning curve and described how he looked for learning opportunities.

You gotta be real motivated and you got to take a lot of responsibility. Start taking a lot of initiative. You can't just show up for work every day and do your job and go home and expect to go anywhere. I did a lot of digging. I'd take things apart and look at them if I had a chance. Did a lot of reading. (Student #1 interview, August 28, 2000)

His advice to new CWE students was,

I'd say ask as many questions as you can. Touch as many things as you can while you have the opportunity. A lot of people in this industry have a lot of experience and they know how to get things done fast and easy and they can also give feedback on, you know, on what you may need to learn, focus on, things like that. Ask a lot of

questions, ask lots of people, talk to different people and, if you're a CWE student and you already have focus on what you want to do, find people who are familiar with that or are doing that type of thing. See what they do. (Student # 1 interview, August 28, 2000)

Unlike most others, this student understood the concept of looking for and pursuing incidental learning opportunities in addition to opportunities presented during the course of a workday. While most students were enthusiastic about learning, they tended to focus on the tasks at hand instead of looking for opportunities to broaden their exposure.

Related to taking advantage of learning opportunities was a willingness to take on new and challenging tasks. While this did not depict an understanding of incidental learning, it did show that some students recognized they learned more by taking on challenging tasks outside of their work assignments.

I'm basically a good worker and will take anything that nobody else wants (to do) or can't keep up with. If there's anything, basically, that I can get my hands on, I'll take a shot at it. (Student #2 interview, August 28, 2000)

Another student told of his experiences working with a volunteer organization as an interim project manager and with a concrete inspection firm. He related that, at the time he accepted these assignments, he doubted their relevance to his Construction Technology program. However, his reflections on the experiences confirmed he had learned about working with different groups of people and a related technical process (concrete testing). Similar to the previous student's comments, his advice was to take every opportunity to learn and not be close-

minded to work assignments that could provide different and rewarding opportunities.

In one instance, an employer hired a student at the same time he began his CWE. This Automotive Technology student was treated as a new employee rather than as a student in a training program. As such, he was assigned to a low level position where other new employees were assigned until they could prove themselves to be good workers. In this case, the student/employee was assigned to the lubrication rack where he spent most of his time changing oil and lubricating cars. While he was frustrated by the lack of training he received, he made the most of the situation through his own initiative.

I go over and talk to the (regular mechanics) some, just to pick things up on my own. Go take my own initiative and go over there, even on my lunch break. Nothing to do, got an hour. I just go over and watch them and try to figure it out. It's basically the way I see it, I'm just waiting my turn to go over to the shop because I'm next in line. You just wait your turn and do your thing to get qualified. (Student #2 interview, August 28, 2000)

Quality of workmanship

Most students recognized high quality work was important for the benefit of their learning and to benefit the business. To an interview question about values important to their supervisors, students most frequently mentioned doing a good job. One student who completed a CWE at a small, independent diesel repair shop noted the importance of quality work to business success.

(My supervisor's most important value is) making sure it is done right and making sure that the people that he working for are happy with the job he's doing, especially in his position, you know, with

his own business. If they're not happy, they're not going to come back. And plus, I've heard someone say, that if you get good service at a place, you might tell one or two people; but if you get bad service, you're going to tell at least ten. And, that's pretty true. In a business like this, you send a guy out in a truck, and if you've fouled it up, with in a matter of hours, it could be everywhere from Canada to Mexico across the CB's and that could really hurt you. (Student interview, August 11, 2000)

Other students had similar observations about doing high quality work:

Thoroughness. Make sure the job is done right. He knows I'm in training and everybody else knows I'm in training, but he doesn't want me to do a job and have the guy come back a week later and say, "Hey, this guy did the job and now look at it; not only did this part go wrong that he installed, but it caused another part to go wrong." So, what's important for my boss, in my opinion, is my knowledge on the subject and my thoroughness I put into doing the job. (Student interview, August 30, 2000)

No matter what it is, no matter what the customer comes in with, I want to try to do my best to do whatever I can to get it fixed, so they can leave with it fixed. My main philosophy is to do my best to make the customer happy and do a good job, make sure the job is done right. I think I speak for the whole shop when I say that because that's how we all work around here. (Student interview, September 14, 2000)

Several of the students in this study did not recognize that the work they did during their CWE was as an opportunity to establish a personal work reputation. While previous research confirmed employers view CWE as an opportunity to evaluate students for employment (Weinstein and Wilson, 1983), some students were unaware of this aspect of CWE. They saw CWE as their chance to evaluate work situations without recognizing the impact their performance could have on future employment. However, one student with an extensive work history stated it

very clearly while another student definitely recognized the ramifications of his current performance.

That's one good thing about the CWE. It gives the employer a chance to see what you can do and how you can do the job. And, it gives the student a chance to see if it's something you'd like to do. (Student interview, November 9, 2000)

(Students) need to be reliable and be ready to work hard and pay attention. Because if they, even in a CWE situation, if you're unreliable, that could hurt you as far as trying to get a job out of school. I mean this valley isn't that big. If you are going to stay, a lot of these mechanics and these guys that are running shops around here. They all know each other and I know that all it would really take is to make one or two of them really mad and you could have a difficult time finding work out here. (Student interview, August 11, 2000)

Respect for trainer's knowledge, skills, and abilities

During the course of their CWE, some students found trainers they especially respected. Their respect was for the trainer's knowledge, expertise, and willingness to help them learn. Students seemed to intuitively understand that, if they worked hard, paid attention, and worked cooperatively with this person, they could continue to benefit from the person's expertise. Students did not take conscious actions to develop relationships with these people other than through their work performance. The following are examples of comments by students who found trainers they especially respected.

Yeah, he's pretty good at that (trouble shooting). That's one thing I would like to get better at. I mean, I can tear it apart, but I can't diagnose the footprint. I mean, I'm getting there, slowly getting there, but I mean, what he did was amazing. He knows gasoline, he knows diesel, he knows refers, refrigerator trailers, I mean, generators, he knows it all. . . When you're working with a guy like that, you go clean a part or tear out the head gasket, and he'll sit there and

go, “You see this little part, it shouldn’t be like this. The reason why this is . . .” He’ll sit there and look at a head gasket and he’ll act like there’s actual words (written) on it, and it’s telling him the entire story that’s going on and what happened. And, I’m like, wait a minute. Where are you seeing all crap? And he’ll sit there and tell you exactly what happened. It’s like, where do you see that. I mean, years of experience. One of these days I’ll be like that. (Student interview, August 30, 2000)

The guy is just amazing to me, just the knowledge that comes out of him. I’ve watched little methods of how he does things and diagnosis things and I’m in awe of him. You’ll ask him a question about something and he’ll just blurt out all these different test that you can do to it and like, wow, without even thinking, just automatically blurt out something. I look at him, as far as automotive and working habits, I look at him as a really good role model. (Student interview, September 14, 2000)

Relationships with other employees

The head guy down there, one of the things most important to him was that whoever came in was able to get along with the other guys in the shop. (Student interview, August 11, 2000)

In a typical organizational socialization process new employees often adjust or change their behaviors and attitudes to align with the interpersonal dynamics of a workplace. Since most of the students were also paid, they were often considered new employees as well as students. In general, the students in this study believed their attitudes and behaviors were appropriate and acceptable to their co-workers. They did not feel they needed to adjust their behaviors to have effective relationships with co-workers. However, in two instances where students specifically denied making adjustments, the researcher noted that they appeared to have

adopted speech patterns virtually mimicking their supervisors! Typical student comments about getting along with other employees were:

Yeah, I think I fit in pretty well there. The other technicians, I had a lot in common with the other technicians and operators. You know, I was able to sit down with a lot of them and just BS on the breaks. So, I don't think there's whole lot of adjustment. I think most of the time, you know, people are, a lot of times in places like this people form certain small social groups. I think everybody usually finds a place. Everybody there seemed to socialize pretty good. (Student #1 interview, August 28, 2000)

I'm a pretty relaxed, easy-going kind of guy and, when I came here, they made me feel right at home. That's how cool these guys are. They made me feel right at home because I was the new guy; but, they were laid back. They were joking with me. They let me know, hey, you're a part of us now. They let me in their little group. No, I don't think I had to change anything. I just fit right in. They made me fit right in. (Student interview, August 30, 2000)

One student reported being the subject of a hazing episode as part of a ritual of induction for being accepted at that particular business.

Yeah, they played some practical jokes. I remember I was going to, I was either draining oil or draining transmission fluid. And I went to get a pan to put the fluid in and Bob said, "Oh no, you don't need a pan that big. Just go get this little pan." And I was thinking to myself, this is too small. But he knows what he's doing. So I get the little pan and put it under there. And of course it was too small. And it fills up and starts flowing all over the place and I made a big old mess. And he's standing there laughing at me because I should've known better. But I learned right there that sometimes when you know better, you can't just take their word for it. Because I saw them do the same kind of thing to another guy. (Student interview, August 11, 2000)

Another student spoke of being humble during conversations when more experienced workers explained something. His advice was to listen to these

people, even if you believed you already knew what they were telling you. In most instances, through expressing interest and asking questions, the student discovered he could guide a conversation to topics or areas he was not familiar with and learn from the exchange.

Take everything in. Don't sit there and say that you know something. Because, there's a lot of things I know out here and these guys will try to tell me, over and over again, how it's supposed to be. And I don't sit there and say, "Hey, man, I know what I'm doing. Just leave me alone." I'll sit there and say, "Really, oh, okay, yeah, all right, well, what if I did this?" You know, I take in the information like I'm a retard and I don't know what I'm doing. My advice, if they want to tell you something and you know it all ready, just bite your tongue and listen. And, ask questions, you know, put your opinion in, "Well, could I do it this way?" or "Could I do it that way?" Kind of communicate with them, talk to them and be cool. (Student interview, August 30, 2000)

Patience, frustration and anger

Several students talked about the need for patience and to not become frustrated by job situations. In some instances, students had expectations for their work experience but found actual work situations quite different from their expectations. Most students recognized the need to find a balance between being too aggressive and appearing reluctant to get involved at the beginning of a work experience. When asked what advice he'd have for students beginning a CWE, one student said,

For the first couple weeks or whatever, (a student) should get to know the people and how the shop runs. Take it easy, kind of sit back and watch how the shop operates. Look to see how things are operated as far as work assignments and stuff like that. I mean gradually. Don't just rush right into something without knowing

how to do it. I mean, watch how they perform. Then, later on just gradually get involved with the work. That's what I would tell them. (Student interview, September 14, 2000)

Students recognized that every work activity does not go smoothly. Several related stories about their own impatience contributing to frustration and avoidable mistakes. One student related the following experience.

You gotta have patience. It'll come. The boss got onto me one day because we were putting a hood on a truck and I kind of just (tried to make it fit). Come on, come on, and I dented it. The hood was made of fiberglass and I set it on the bumper and was yanking and pulling and tugging, and I broke it. It was just because I wasn't patient. (Student interview, August 30, 2000)

Several students talked about ways to handle frustration. For most students and trainers, an effective way to handle such situations was to physically and mentally get away from the problem for a few minutes.

Just don't let the stuff get to you, I guess. Take it easy. Anytime you're having trouble, take a little break, walk away and come back or it'll just get worse. (Student interview, August 25, 2000)

Like a lot of times if I got a job that is really, like stressful and I'm wracking my brain and can't figure it out, if I keep building on that job and I can't figure it out, I'll get a headache or something. I just get ticked off. It really helps to go, I'll just take a repair manual and go sit outside and start reading it so I can get out of the shop and get some fresh air. (Student interview, September 14, 2000)

Two students specifically addressed anger resulting from frustration. Their advice was to learn to deal with frustration but control anger so it does not interfere with the working environment. They recognized that anger could cause unsafe situations and detract from productivity.

In this kind of work sometimes things don't work the way they should. And it helps if don't let it really make you mad. I've seen instances with students mainly where they tend to get really angry with a project. And that doesn't help. And I've been known to use some phrases that I wouldn't say around my mother while I'm working on trucks, but you have to draw the line somewhere. That's my opinion. And I've seen people cross that line and when they do, if they ever see anything like that happen, then normally what I've seen is that other people that are trying to help them don't want to help them anymore and they'll turn away and they quit giving advice and they quit wanting to help. I mean that's what I would do. If someone goes overboard, and if they want to start throwing wrenches or whatever, at that point I won't assist them anymore. And I've seen that kind of thing happen in the mill before. I've seen people throw whole toolboxes because they are having trouble working on something. But that's too much. And if I ever come to a point as a supervisor in a shop, I'd be telling that person they can be looking for someplace else to work. (Student interview, August 11, 2000)

Interacting with customers

While most students in this study did not interact directly with customers, knowing how to interact with customers effectively and courteously was an important and integral part of the job for some students. Most students recognized the importance of learning this skill and said their training in school included practice and instruction on working with customers.

(The instructors are) always talked about, when we're talking with a customer that's come in with a complaint and they're asking questions like, "Has this problem happened for a long time or did it just start?" or asking them what kind of symptoms and stuff like that. A lot of it (working with customers), I just kind of learned on my own because I know what was wrong with the car and I'd think, okay, I want to ask them this to see if this symptom occurred with the car. (Student interview, September 8, 2000)

Work ethics

Students did not specifically identify good work ethics as important to successful CWE experiences. All of the students interviewed had previous work experiences, and from these experiences, had developed personal work ethics. In general, the students interviewed believed they were good employees. Most students talked about work ethics in term of employer expectations. A few students assumed that, as students, they had a special status that excused them from good work ethics. As will be reported later, trainers' perspective regarding work habits differed from students'.

Self-discipline. No babysitting. If you got a job, do it, and do it right. Sometimes you can't always do it right, but you're trying to keep the trucks moving. You kinda make your own decisions when you can, just keep moving. They're pretty hard on keeping moving, which is understandable. (Student interview, September 8, 2000)

An honest day's work. Getting in there and getting things done, no lollygagging. It's a pretty cut and dried place down there. We've all got a job to do. These trucks make our money you know, so it's kind of an honest days work for an honest days pay. They expect you to get in there and give it all you have and in return they help you out by giving you a place to work. (Student interview, September 6, 2000)

Strategies Students Used to Acquire Knowledge and Expertise

During the interviews, students repeatedly emphasized three concepts related to learning from a cooperative work experience: hands-on learning, curiosity, and solving problems. From their work experiences students learned to manipulate tools and instruments to build or repair physical objects. For them

success depended upon their abilities to figure out how things work, solve problems, and use their skills and proficiencies to get work done. Curiosity and the mental challenges of using previous experiences and knowledge to solve concrete problems stimulated their learning. From these, students expanded their experience base, adjusted their knowledge of principles, and developed proficiencies. Students aspired to accumulate knowledge about many aspects of an occupation and to use that knowledge to be good problem-solvers and experts in using the tools of their trade efficiently.

Hands-on learning

The hands-on learning is very important. There's nothing like it.
(Student interview, September 6, 2000)

Hands on. I do all right by the book but sometimes you don't quite grasp what the book's trying to tell you until you actually see it.
(Student interview, September 8, 2000)

Students felt strongly that work experiences in a production environment provided opportunities for them to actually manipulate and work with materials and tools in ways they could not in a classroom or laboratory. When students spoke of hands-on learning, they referred to the tactile experience of physically working with the equipment, tools, and materials on real problems rather than watching someone else demonstrate and explain a process. The hands-on aspect of work experience was the point in the learning process where students moved from conceptualization to concrete application. Work experience provided the critical step

that classroom experiences could not. Students observed, listened, and read documentation, but said there was no substitute for actually doing the work.

I learn best by actually doing it myself. If I didn't actually turn the wrench, they can say this is what you need to do. I'd rather do it myself than watch. It's like when you showed up (for the interview) I was pulling a pan from that truck. I'd rather be under there actually holding the gun than watching someone else do it. I mean, its one thing to see it done, it's another to do it. (Student interview, August 11, 2000)

Actually, it (the most effective way for me to learn) has nothing to do with school. They teach us in school how to test things and give us certain principles about automotive stuff, but the way I learn the best is actual hands-on. A lot of times I'll come and ask the trainer questions about stuff and he'll kind of give me hints but he tries to get me to do it on my own, just figure it on my own. That's the way I do the best because I can be told how to do stuff, but for me, personally, I just learn if I actually get in there, look up stuff, and do it with my own hands. That's how I learn the best. (Student interview, September 14, 2000)

Two students mentioned drawing pictures and diagrams as guides for reconstructing or putting a piece of equipment back together. Students also used drawings to plan sequences and depict finished products or processes.

Practice

An important aspect of hands-on learning was practice. In production environments, many tasks or jobs seem repetitious. However, these tasks often have many variations. Practice enabled students to broaden their experience base through exposure to those variations. It helped students to increase their knowledge and ability to handle a wider range of situations. Work situations also

provided opportunities for students to develop and hone eye-hand coordination and dexterity skills required in most professional/technical occupations.

You need to practice doing things. I suppose it's just like playing baseball. You need to practice to stay good. (Student interview, August 11, 2000)

Sense of curiosity

A sense of curiosity caused students to ask questions for understanding, explore new areas, and search for more information. Curiosity drove students to pursue answers to “How?” “Why?” and “What if?” questions. During the interviews, students revealed a spectrum of curiosity. At one end of the spectrum was curiosity about assigned tasks and jobs that came to them in the course of a day's work. This more common curiosity stimulated students to ask questions for details and explanations about the projects or tasks they were working on. In this way students filled information gaps, learned about different options and perspectives, and expanded their knowledge about a particular topic.

Yeah, I ask lots of questions. I mean, (the trainer) could tell you, I ask millions of questions. I just want to know. When it comes to something, a lot of people can tell you, fix this or replace this; but I'm the kind of guy that wants to know exactly how whatever it is that I'm replacing works. I want to know everything about it so I know. Okay, I did this because this happened and when I did this, it's gonna fix that. I just want to know how everything works so I do ask a lot of questions. (Student interview, September 14, 2000)

At the other end of the spectrum was a less common type of curiosity, an aggressive curiosity. It separated students who recognized and aggressively

pursued incidental learning opportunities from those who were only curious about the tasks and jobs assigned to them. As an example, an aggressively curious student was compelled to find out how a pneumatic impact wrench actually worked in addition to learning to use it as a tool. This curiosity came from a strong motivation to take maximum advantage of opportunities to learn about an occupation and a work environment, to recognize and pursue incidental learning opportunities. Few students exhibited this type of curiosity.

I'd say ask as many questions as you can. Touch as many things as you can while you have the opportunity. I'm curious. I did a lot of digging. I'd take things apart and look at them if I had a chance. Did a lot of reading. I still do a lot of research at home. A lot of people in this industry have a lot of experience and they know how to get things done fast and easy. They can also give feedback on, you know, on what you may need to learn, focus on, things like that. Ask a lot of questions, ask lots of people, talk to different people and, if you're a CWE student and you already have focus on what you want to do, find people who are familiar with that or are doing that type of thing. See what they do. (Student #1 interview, August 28, 2000)

Here is how this student described his career progression during the past three years and credited his rapid advancement to his aggressive curiosity.

I started out testing boards, board test technician, and worked my way up to systems technician. Later, I was managing the test equipment and I started doing side jobs for engineering. Eventually, I worked my way into engineering. They felt they needed me full time. And from there, my learning curve went like that (gestured up steeply). I learned a whole lot about engineering, electrical engineering, electronics, programming. That's what I do now. My job title is embedded systems engineer. I do a lot of embedded programming. It's kind of like programming on a CD. (Student #1 interview, August 28, 2000)

Another student whose motivation to learn was evidenced by his aggressive approach to questioning had these comments.

Interviewer: Do you consider yourself curious?

Student: Oh, yeah. Very. I love to learn. I always asking questions and sometimes I probably ask too many questions but I just, I've always been like that. I like to ask question, I like to know why that does that, what makes that do that, stuff like that.

Interviewer: Are they receptive to the questions?

Student: Yeah, you betcha.

Interviewer: Have you ever had an instance where you felt like you were asking too many questions or bothering them?

Student: I don't really care. I'm there to learn just like they were 20 years ago, so I figure they probably asked a lot of questions 20 years ago just like I'm asking today. It don't bother me. I don't ever feel like I'm being a nuisance or anything like that. I don't think they feel any different. I mean, it's beneficial to them for me to know as much as they do. It's a team effort and we gotta work as team to get these trucks fixed in a timely fashion. So, it's beneficial to them for us to ask questions. I think it would be a hassle for us not to ask questions and not want to know why and stuff like that. (Student interview, September 6, 2000)

Solving problems

Most students considered the ability to solve problems as crucial to success in an occupation. Problems challenged students to draw on previous experiences and knowledge of principles and apply them logically to resolve anomalous situations. As a learning strategy, the process of solving a problem forced students to evaluate and analyze situations and anticipate consequences from a variety of options in a logical sequence. Concrete actions resulted in a sequence of situations

that added to students' information and experience base. On-the-job problem solving could be described as a series of questions to which technicians and students must find answers.

The first thing I try is, of course, solving it myself. If I have a clue as to where I can find information on this subject, I'll usually try that first. If that doesn't help or I don't have a clue or if I still can't figure it out after I'm given a clue, I usually consult with someone who I think may be familiar with that particular problem. They can usually show you their resources and say, "Well, you might find it here or you might find it there," or "Here, check this." (Student #1 interview, August 28, 2000)

I usually try to look at it first, try to duplicate what the problem is. If it's something that I feel is something easy that I have enough knowledge to figure it out, then I'll just keep going with it. Even if I struggle a little bit, I'll just keep going and look at different stuff. Usually if it's something that I know, like an electrical problem or stuff like, that I know it's going to be real deep, I'll usually go ask (the trainer). I'll say, "Hey, this is what I got. Have you ever had this before? What can you help me out with as far as where to start testing?" That's usually what I do. (Student interview, September 14, 2000)

Students observed that, in the classroom environment, problems devised to teach trouble-shooting were isolated from surrounding systems. Students said the most challenging aspects of many problems pertained to surrounding systems. Classroom situations tended to artificially isolate problems. Challenges and learning came from working on an entire system. For example, the following description is about a process the student learned in class; but, when it came time to actually perform the task, the problem was entirely different.

I had to change a clevis pin today on a truck. I know how to do it. It's pretty simple. But, one of the mechanics, he asked me, "Do you feel comfortable doing it?" I said, "Yeah, sure." Okay, I mean, like,

you got 2000 pounds of spring pressure in there and if that thing blows up, boom, bye-bye. I said, “yeah, sure, no problem.” But I asked him (for advice), because it was seized up. He told me, “Simple, you gotta take the slack adjustor all the way back so it’s not in the way, release the brake, and then you got that 2000 pounds of pressure off the clevis pin bolt.” And it’s like, because the clevis pin was, because the actual clevis was seized up and I couldn’t get it off there. But he told me, release the brakes, you’ll have the spring pressure off there and you can just twist it off. Like, tried it. Bam. Simple. (Student interview, August 30, 2000)

Coming out here we get to deal with real problems and coming up with real solutions and not just made up problems. In school we learned a lot about taking things apart and putting them back together, but a lot of times when we are doing that there is no real problem with it to begin with or, if there is a problem with it, it is not something that we’re going to fix. We find out what the problem is and see it but then we don’t solve the problem. So it’s a lot more satisfying to actually accomplish something. (Student interview, August 11, 2000)

Learning from mistakes

Mistakes are an element of problem solving, but students usually viewed mistakes as thinking errors or misjudgments that caused something to go wrong. Making mistakes created high impact learning situations because the results were often very obvious and expensive.

I seem to learn more from my screw-ups than getting things right the first time. We were putting some push rods in an engine and when I set them down in there, I didn’t set them in quite far enough. And what I learned is that when you put them in, they’ll kind of stick, and you can feel it if you try to pull them back out. Well, I just kinda dropped them in there. When you do that, and then you turn the engine over, it bends all the push rods. That’s what happened. Yeah, I won’t do that again. (Student interview, August 11, 2000)

I think making mistakes (is important.) The more, the better you learn, I think. And, I’ve made plenty of them. (As an example) I had a throw-out bearing I was trying to get out. I went awhile before

asking the right way to do it and I beat the bearing out of there and kinda bent it up pretty good. If I'd have just taken more time and found out more information, I'd have found that it could have been done a lot easier. (Student interview, August 25, 2000)

Learning through observing and listening

Some students talked about learning by observing and listening, but their stated preference was to learn through hands-on work. In discussing observation as a learning strategy, students considered it a distant second to actual hands-on manipulation.

Even if you are not doing a whole lot of actual work, if you can see what is going on and they let you do a few things, that you can really help you learn, but I like it best actually to do it myself. If I didn't actually turn the wrench, they can say this is what you need to do but I'd rather do it myself than watch. ... You can stand there and watch somebody do it and it doesn't really look it's that difficult. But you pick up that one-inch gun in your hand and it's heavy and you start sweating and its hard work. It's a lot different when you do it yourself. And then you understand a little better. (Student interview, August 11, 2000)

Another student reported that observation was his primary strategy for learning.

I pretty much just watched. They would do it and then I would do it. I pretty much just watched what they did and went from there. A lot of the stuff I'd learned already from some of the classes I've taken. Just basically watching what they were doing. Sometimes they showed me how to do it. For the most part, just watching. (Student interview, November 22, 2000)

This student's trainer, however, had different expectations of the student. He needed someone to learn skills and accomplish productive work. In this case,

the student did not practice the skills shown and therefore did not develop the expertise the trainer expected and needed. The trainer eventually fired the student for lack of initiative.

Students did not recognize listening as a primary strategy for incidental learning. However, listening was very much part of their learning process. Several students acknowledged they learned from conversations with their trainers and other employees at their work sites. They cited lunchtime and coffee breaks as times when technicians often talked informally about projects and problems. Occasionally, these conversations became group problem-solving sessions. More importantly, they were opportunities to learn about organizational and occupational subjects such as employment situations, company policies and politics, and to increase tacit understanding of life as a welder, mechanic, or technician. The stories other employees shared conveyed company culture and values and sometimes provided specific technical information about a past problem situation. These informal conversations among employees were important sources of practical and tacit information about organizations and occupations.

Yeah, sometimes we gather between shift changes while everybody is there and kind of stand around and BS, you know, about yesterday's work or today's work or personal, you know sometimes. Yeah, we kind of hang out every once in a while in between shifts or something like that where we have a few quick minutes and everybody is kinda getting out of their coveralls and into their home clothes. (These sessions are beneficial because) just kind of hearing what every body has to say, what their ideas, views and opinions are, whatever is going on and stuff like that. (Student interview, September 6, 2000)

Access to sources of information

Trainers and other employers were the most common sources of information for students. Although some students said they referred to manuals and other types of documentation, having access to trainers and other employees as an immediate source of information was important for them. This access enabled them to fill gaps in their knowledge while working on projects.

Access to trainers was a valuable benefit of CWE experiences. In many instances, students worked along with technicians or had ready access to them. Students appreciated opportunities to work independently but felt reassured knowing they could contact a trainer or co-worker for help.

Normally we work together most of the time. If something comes up and he wants me to do something, he'll ask me if I'm familiar with it. And if I'm not, then he'll guide me through the process. And we'll go from there. (Student interview, August 11, 2000)

He was there for two weeks after I started. So I had somebody looking over my shoulder. Also, like I said, the first couple of days I spent pretty much following him around, asking questions, and learning where the bathrooms were and things like that. Then it switched, so okay, I had him there to answer my questions. Am I doing this right? He kinda looked over my shoulder. There was a couple more days of that and then he pretty much started doing his own thing and I started doing mine own thing. (Student #1 interview, August 28, 2000)

Students recognized, in a production environment, they needed to balance their learning with getting work done. In most cases, students either worked with trainers or in close proximity so they could ask questions as work progressed. If

expediency in completing a job was a priority, students asked fewer questions and focused on completing or helping to complete the job.

I work with him. And, while I'm working with him, he kind of explains what he's doing and why he's doing it. There'll be certain questions that I'll ask him, like, if we're tearing it down and there are certain things I need to know for the next time I do it. (Student interview, August 30, 2000)

Students also found a balance between using this relatively immediate access to information to learn versus substituting it for their own learning. Their motivation to analyze situations and solve problems for themselves meant most students asked questions only after they had tried to arrive at answers by themselves.

Usually if it's something that I know when I start, like an electrical problem or stuff like that it's going to be real deep, I'll usually go and ask the trainer. I'll say, "Hey, this is what I got. Have you ever had this before? What can you help me out with as far as where to start testing?" That's usually what I do. (Student interview, September 14, 2000)

Feedback to students

Students reported that almost all feedback they received from trainers came as guidance for improving performance. They said the negative feedback they received was usually about situations they already recognized as wrong or a mistake. None of the students interviewed reported regularly scheduled evaluation sessions regarding either their technical performance or work behaviors and attitudes. In most cases, students did receive some performance evaluation from their

CWE advisor at the end of the term or work experience. Advisors based these evaluations on inputs from the trainers. The following are representative comments regarding feedback from trainers.

Yeah, they kept a pretty close eye on me. When I was doing something, they'd call my attention to things. In some cases it could be pretty dangerous like when we were breaking cylinders of concrete sample. We used a hydraulic press and, if you don't do the procedure right, you could blow something up. Yeah, they kept pretty close tabs on me and told me when I did something wrong. (Student interview, November 9, 2000)

I'll mostly ask for feedback on how I did it, not what I did, because if it's something that they can trust me that I've done on my own, its because they've seen that I can do the work. So, it's not on what I did, but how I did it and how could I do it better. Most of the work that I do, I know I can do it, and they know I can do it, but I just want to make sure. "Did I do it fast enough? Is there a short cut I could have taken to do it better? Or is there a certain bolt or certain things I could have not taken out in order to do this a lot quicker? I can do the job, but I just like to know, hey, how was it? (Student interview, August 30, 2000)

During the course of conducting the interviews, the researcher heard of two instances where student behavior became an issue with a trainer. In one case, the student was fired but, according to the student, never received specific information about what he did wrong. In the other case, the trainer asked the CWE advisor to handle the situation and the advisor moved the student to another work site.

Trainer Interviews

CWE advisors selected training sites because they believed the sites were safe environments and the shop supervisors would provide a range of training

situations for students. Supervisors agreed to provide training for CWE students for several reasons (Wiseman and Page, 1983) such as opportunities to screen potential employees, reduce recruiting and orientation costs, increase productivity, and increase employees' motivation. Also, they wanted to help the educational and professional development of potential employees by providing positive and productive introductory professional experiences. In general, supervisors assigned students to train with knowledgeable and highly skilled technicians.

In this present study, most of the people providing training were both technicians and supervisors. In two cases, interviews were conducted with a shop supervisor and a technician together. In one case, the shop supervisor and the technician working directly with one student were interviewed separately. This was based on the student's comments regarding this particular technician's expertise and training capability. All of the individuals interviewed were directly involved in training students and are referred to as trainers in this report.

Interview comments by these technician/trainers were grouped according to expected attitudes toward work and learning, behaviors that reflected those attitudes, and strategies trainers believed students should exhibit to learn effectively.

Expected Attitudes and Behaviors

Eagerness to learn

Trainers expected students to have positive attitudes about working and learning. They expected students to be highly motivated and eager to learn and

they expected students to show this through their behavior. They also expected students to want to be excellent technicians and employees.

They were eager to learn, to listen. They asked good questions and they listened to what I had to tell them. . . . You want to see the initiative; you want to see that they want to learn. I don't even know how to explain it but I been doing this long enough that I can see a guy pretty close to right off that really wants to show you something or really wants to learn. He may be a bit hesitant on how to do it but he wants to learn how to do it as opposed a guy who, "This is heavy, I don't like this job" (whining). He can go find another one.
(Trainer interview, August 21, 2000)

When I was an apprentice, I was the first one there every morning and the last one there in the evening. If there was a job there that I was interested in learning about that somebody else was doing, I stayed after my shift to observe. I did that on my own. I wasn't paid for it or nothing, but that was just me. You don't see that now days. You see, I want eight hours worth of pay because I showed up.
(Trainer interview, September 14, 2000)

For trainers, motivation to excel is more than just doing assigned tasks well.

It is a compelling drive to be an exceptional technician, to take advantage of learning opportunities whenever and wherever they arise, and to develop technical expertise.

Listen, pay attention watch, don't space out. Be there, be present. Develop a desire to excel because if you don't have that, you might as well work at Taco Bell or do something else. You just have to have a hunger for knowledge. Just to be open and try to do the best you can all the time and don't let up. Try to see the bigger picture, not the little picture. (Trainer interview, November 10, 2000)

One student in particular took the initiative to find out what the whole process is as much as he could. (He did that) by coming in early, asking questions, staying late, and just asking questions, you know. We were all out there so he started asking questions when we had a few minutes of time when we weren't worried about a task or anything else. So that way he could glean a little more from us. It

showed he was extremely interested then, and if we were interested in hiring somebody, we'd look for someone that was interested in what we were doing. Not someone who was just here to do their tasks. We want someone who seemed to care about the place. He was here to work and enjoyed it and it showed. He probably got a lot out of it. (Trainer interview, August 18, 2000)

Respect for trainers

Trainers know they have knowledge that students need and want. Several said they expected students to respect their knowledge and technical expertise. Some specifically said being liked by students was not a concern. They were committed to teaching students whether they liked or were liked by the students or not. In return, they expected students to respect them.

From the trainers' perspective, students convey respect through their attentiveness to what trainers say, the sincerity and pertinence of their questions, their willingness to be helpful and supportive, their eagerness to learn, and by demonstrating good work ethics. Trainers implied they would devote more time and energy to training if they believed students respected them and were sincere in their efforts to learn.

For a mechanic, one-on-one, respect is important because for me personally, I have to respect the guy's knowledge that I'm helping or that I'm working with, and know that he'll be as thorough as I'm going to be. As far as, if the student doesn't like me, that's the student's problem, because in this world of mechanics, when he leaves school and goes to a shop, he's not going to like a lot of the guys he works with, but he's got to learn to deal with that. (Trainer interview, September 14, 2000)

Trainers clearly do not like cockiness. Trainers know they have worked hard to become good technicians and that it took many years of experience to acquire the expertise and knowledge they have. They expect students to listen to what they have to say and not act as if they already knew everything.

He's very enthusiastic, he's great, he's an intelligent kid, he's got the world by the tail, but he doesn't listen well. He's already formulating a response when you're half way through a sentence and interrupting you. It's kind of like, shut up, just listen. You're going to get your chance. (Trainer interview, November 10, 2000)

Actually, he was cocky. He was cockier than s---. That wasn't good because you'd ask him something and it was always, "Yeah, I know, I know." No, you don't know. That's why you're here.... Yeah, his cockiness was getting him in trouble. Always having to de-horn him. Didn't know squat. That was what the heck he was learning for, that's what he was going to school for. Trying to learn something new, not know it all already. (Trainer interview, August 25, 2000)

Willingness to work hard

All of the trainers interviewed were hard workers and they expected students to work hard and be fully involved in the operation. They viewed hard work by a student as an indicator of the student's commitment to the learning process and determination to excel, two qualities expected and respected by trainers.

It's the guy who comes in and looks over there and sees another guy making five whatsits and drives himself half crazy figuring out how he can do six. How he can beat that guy by even one whatsit. That's the guy we want. We want the guy who wants to win every time. Don't put him in a race and expect him not to win. Don't tell a guy he can't do something. I love that guy. (Trainer interview, August 21, 2000)

I think the school really needs to impress on someone when they come into this class, that this is a backbreaking job and if they aren't willing, they shouldn't even attend. I've been in this since I was 17 and I started at the bottom. That taught me right now that you're going to go home tired and dirty every day. If you're not ready to work and sweat and go home tired everyday, then get out. If you don't want to learn the trade, you shouldn't be there. It's a rough business. I can't find guys that want to work. They want to collect the check, but they don't want to work. This is type of trade where they have to understand that you're not there just to make yourself a living, but you're there to make the boss a living. And, if you don't make the boss a living, you ain't gonna make a living yourself.
(Trainer interview, November 8, 2000)

The following comments about hard work also reflect a sense of humor most trainers consider important to workplace cooperation. While they work hard, they enjoy what they do. That enjoyment was reflected in their own attitudes.

I mean, if a guy comes in he's got to realize that it's heavy, hard work. We have a lot of equipment to help people, cranes and such, but it's still basically humping steel. Don't be a wimp, don't be a puss. Get in and do it. If the crane's not available, get two guys and let's get it up and going. You will set yourself on fire and you will get burned. Plan for it, expect it. You will break things, cut things. That's just what happens. You just gotta look around and make sure nobody saw you do it. By god, if anybody seen you do it, you're just gonna catch hell until someone makes a worse mistake! (Laughs) If nobody saw you do it, you can make up a really good story about it.
(Trainer interview, August 21, 2000)

Work ethics

Trainers said good work ethics were important for two reasons. First, if a company was using the CWE program to screen for potential employees, they looked for students with good work ethics. Trainers considered good work ethics as a prerequisite for employment consideration. Second, as with hard work,

trainers believed students showed commitment to learning, work, and the profession through their work ethic. They viewed students with good work ethics more positively and were likely to invest more time and effort into training. These students were accepted into informal work groups more readily and had better relationships with their trainers. Trainers were clear that they did not have time to waste on students who did not show commitment to the training effort through good work ethics.

If a guy's in here and he's yawning and he's tired, and "My CWE advisor said I have to be here." If the first words out of their mouth are that, well, you know, you really don't. You can go and I can get back to work. (Trainer interview, August 28, 2000)

First impressions

In a production environment where time is a valuable commodity for wage-earning employees, technicians usually don't take much time to get acquainted with new employees initially. Instead, familiarity and relationships develop over time as employees evaluate the work habits, expertise, attitudes, and personality of a new person. Since CWE students were frequently viewed as temporary, employees tended to make initial judgments about a student's potential and may or may not invest time to get acquainted. Because they were unlikely to invest much time in re-evaluating this initial judgment, a student's first impression was often the primary basis for employees' attitudes toward a student. This initial impression was important because trainers were likely to use this impression as basis for deciding how much effort they would expend on training the student. From the

trainers' perspective, students have primary responsibility for making a positive first impression and for developing and maintaining effective relationships with them and their co-workers.

I mean, I can just tell. I can tell by how he moves around. I can just about tell you by how he walks from there to come into my office. I'm looking at his ambition and a sharp crispness of his ability to communicate. You kinda look for a little gleam in their eye like, man, they're really eager to get into whatever's going on. Hey, you bet. And, then as you get a chance to talk to them, hopefully, he'll say things or behave in a manner where you may change your initial impression. But, then, it doesn't take you but just a few seconds to start to develop an opinion of the guy. (Trainer interview, August 28, 2000)

Sit these guys (students) down. Part of their curriculum should deal with the interviewing process and kind of things employers are looking for, kind of attitudes they're expecting, and how you should be approaching your prospective employers. Not only as you get started on looking for a job but even during the CWE program. It's very critical that they know, when you walk in the door, what these people are looking for and how to get around and how to make yourself shine. Realize you only got a short period of time to impress somebody with what you know. And, it's more important to impress somebody that you're a good person, that you're reliable, that you're honest than it is to ever imagine that you're going to impress somebody with your mechanical skills. (Trainer interview, August 28, 2000)

Patience

Trainers suggested that CWE students need to take time to assess their role in the operation. Through observations and questions, students should acquire basic information about a company such as operating procedures, organizational structure, and physical layout. They should also come ready and eager to go to work, but have patience until they are invited, told, or otherwise signaled the right

time to become involved. Typically, trainers were eager to train students, but wanted to feel like they were in control of the student's access to their workspace. They did not like for students to come in with a know-it-all attitude and expect to work independently.

Assessing work environments and the personality and attitude of persons assigned as their trainers can be challenging for students. At this beginning point, quickly establishing positive and effective relationships with their trainers becomes critical in that trainers immediately begin evaluating students' attitudes. Trainers used these evaluations as basis for deciding the amount of effort they were willing to expend on training. Typically, trainers responded positively to students who were patient and showed they were willing and eager to work and learn.

He was here but he was a little bit shy, not knowing the routine or exactly what to expect in the work situation. But once we began to get in, I mean, give him a project and, boom, he was gone to working on it. He was eager to get going. He wanted to carry on with the things that we told him that he was going to learn while he was here. So, he was a little shy to start with, but once he started falling into the routine, then he has followed along real well. . . . I'd say he was self-confident, yes. Just a little apprehensive on maybe trying to jump in with both feet. I really respect that in a person, to just kinda hesitate a little bit and try to see totally what is going on. (Trainer interview, August 11, 2000)

Does he want to work? Is he willing to jump in and help out or does he stand back and you have keep telling him things to do. I like them to jump in, jump in and lend a hand. So, the eagerness to work and the eagerness to learn is the big key. If they stand back, then I usually give them three, four, five days, and, if they're still standing back, then they don't make it in my eyes. (Trainer interview, September 14, 2000)

Paying attention and following directions

Paying attention and doing as directed demonstrate respect. When trainers spoke of paying attention, they often meant not only listening to instructions and information relative to the tasks at hand but also observing and learning about organizational and occupational issues. Trainers recognized that students may have been taught differently and were willing to discuss different approaches and methods with students; however, they expected students to follow directions. Trainers believed that, in almost all cases, the methods and techniques they used were safe and based upon successful experiences.

Pay attention to instructions and advice. That's why we're here. Ask questions before you do something. If you don't understand it, yeah, you need to clarify it; otherwise it can be expensive and dangerous. (Trainer interview, November 10, 2000)

Do as you're asked to do the first time. They may not agree with it, they may not like it, but, if that's what the boss wants you to do, do it. If it's something, you know, if he tells you climb on the roof and dive off, you may want to question that, but other than that, if he wants you to do something, just do it. (Trainer interview, August 21, 2000)

Work hierarchy

Trainers reported that in most work environments a hierarchy based on a variety of factors exists among employees. Experience and expertise were primary factors and shop supervisors typically made job assignments based on these two factors. Certain privileges and status were afforded to those at the higher end of a hierarchy. Employees with the highest status typically got those assignments that

required the most expertise, were financially most rewarding, and provided the best working conditions. Since these assignments were earned through experience and proven expertise, employees recognized and honored this hierarchy. Trainers observed that some students believed their status as students entitled them to perform tasks not consistent with their status among other employees. For example, a Diesel Technology student believed that because he worked on engines in class, he should be assigned to work on engines during his CWE. Since diesel engine repair was a high status assignment in most shops, students were generally not assigned to work with engine repair technicians until they had proven their capabilities in other, lower status, assignments. A student's lack of awareness of and respect for this hierarchy could be a source of frustration and misunderstanding between the student and regular employees.

(Students need) to realize that there's a starting point. They're not entering at a mid-level position. They're starting at the bottom and being tested and watched to see what their capabilities and skills and natural tendencies for those things are because, as an employer, you try to evaluate that and learn pretty quickly because there's not a lot of profit margin in our business. (Trainer interview, November 10, 2000)

If a guy's showing initiative, and is not afraid to do the nasty job, well, that's where you start. We got a sandblasting booth that's pretty much the starting place. If a guy gets in there and just goes at it every day, doesn't say much about it you know he's not afraid to work and kicks it out. It's not that hard of a job, but it's miserable. He'll get out of there pretty quick. The guy that whines and complains about it and tries to get out of there, you know, we'll leave them for a while. After that he goes out back and shovels pigeon crap. (Trainer interview, August 21, 2000)

Living with mistakes

During the focus group with CWE advisors at the end of the study, one advisor suggested students might be reluctant to begin a task or work independently for fear of making mistakes. However, the trainers in this study expressed patience with students' mistakes. They expected mistakes by less experienced employees but believed the adage that a person should learn from their mistakes. They were more interested in students' initiative and learning.

If a guy's showing some initiative and makes a mistake at it, makes an honest mistake, he's not going to catch hell on it. There's a difference between a lesson learned and a mistake forgotten. No one here is ever going to catch hell here for learning a lesson. (Trainer interview, August 21, 2000)

It's more of a learning experience. All these guys know, hey, we're going to make mistakes. As long as we use them to learn from then, it's okay. We didn't waste all that just on a mistake. If anything, it's just a (type of) tuition around here. (Trainer interview, August 28, 2000)

Cooperation

Trainers viewed the ability to work effectively with others as crucial to productivity. They did not expect or care if they became friends, but they did care that they were able to work together effectively, cooperate with each other, share information, solve problems together, and contribute to a pleasant working environment. While supervisors respected and appreciated technicians' ability to work independently, their highest priority was getting jobs completed. Therefore, they expected

employees to work together effectively. Many tasks require more than one person and frequently employees had to work together to get the work done.

We work mostly individually, but as a whole, we try to get things done as a team. So everybody helps everybody out, so that means if you need a hand, you just come and ask and they'll give it to them. If they've got a question, obviously someone is always going to come and help you out. (Trainer interview, November 10, 2000)

When my other employee started yelling at him, I knew there was a big problem because neither of us yells at anybody. I'd hear him yelling and I go up, "What's going on?" and he'd say, "Geez, he just killed me again." Getting guys injured because of him. Like I said, he just couldn't get the concept of teamwork and that's a big thing in construction. I've had this guy work for me for five years and it's like we have four hands together. And I needed actually two more guys like that to build this house. (Trainer interview, November 8, 2000)

An Automotive Technology instructor observed that a challenge for him was to convince eager mechanics to "get their heads out from under the hood of a car and talk to people." Because students tended to focus on the technical aspects of the profession, he purposefully emphasized communication skills and working relationships in order to develop technicians with an appropriate balance between technical and interpersonal skills. Several trainers and shop supervisors said that being able to work cooperatively was equally as important as technical skills.

(Getting along is) extremely important, especially in a small shop like this one. There are only six or seven people here. Everybody needs to get along with everybody. You don't have to entertain with them in the evening, but you definitely have to get along during the day. There are very few people that I've hired who don't get along okay. I usually talk with everybody and ask, "Is this going to work out for everybody?" because we have to be like a family. That's very important to me. (Trainer interview, November 10, 2000)

My guess is (a work experience is) more of an opportunity for them to learn about the guys out here. How to socialize. These guys are pretty harsh out here. You walk in and act like you know something, they going to watch you drown. You know these guys have been doing it for 50 years. So, humble yourself, you know, 'til you got a few years, listen, talk. These guys will take you under their wing and they'll teach you. Just learn how to get along, it's so important to learn to get along with these guys around here so they'll take you in. Otherwise, yeah, they can pretty well isolate a person who comes in with an attitude. It's kind of a bad deal when you can't get along with people. These guys can isolate you in a hurry. So, it's very clear that it's most important to learn to get along with these guys. (Trainer interview, August 28, 2000)

Communication skills

Some of the trainers in this study were also supervisors. Those who were supervisors expected employees to be able to communicate effectively and respectfully. As stated earlier, developing friendships was not a priority, but being able to exchange information and opinions effectively was vital to successful and safe operations. Supervisors also expected employees to respect the feelings of others as they interacted during the workday.

For these supervisors, two other aspects of workplace communication were important. First, supervisors understood employees would disagree and argue about work-related issues. Supervisors were more concerned that employees be able to communicate and work together after disagreements than they were about a process for resolving them.

But, as far as a disagreement that way, we don't have too much of those. I think someone, I can't remember who it was, there for a while but it ironed itself out and that's part of the environment. I've had little disagreements with guys but we get over it. As long as it's

not festering and held inside. As long as you just hash it out and get done with it and move on. Leave it here when you go out the gate. That's going to happen in any work environment. (Trainer interview, August 21, 2000)

Second, supervisors recognized that employees spend a large part of their lives on the job and they wanted employees to enjoy the environment. Therefore, humor was important. Sometimes this took the form of teasing and practical jokes. In some instances, this was a way to test the mettle of new employees or to initiate them into the profession. Supervisors accepted this as long as it did not interfere with effective communications and shop safety.

These guys will joke with each other. And that's one of the things that I promote out here. Hey, you know you spend most of your life, most of your awake hours, working. Enjoy it while you're here, I mean, be careful because you don't know who's around. Be easy on the jokes and the dirty language and whatever because there could be one of these gals sitting in the cab of a truck. (Trainer interview, August 28, 2000)

Interacting with customers

Trainers considered the ability to interact effectively with customers an aspect of communication skills and working relationships. For some CWE positions, customer service was an important part of the job and trainers gave it a high priority. For others, it was less important since technicians did not regularly interact with customers.

Learn as much about the customers as you do about the work that you're doing on the trucks. The people skills. Hey, don't be so quick to throw the hood open and start working on it. Greet the guy, see what going on. Hey, I'm the guy that's going to be servicing

your truck. People really like that. If the guy's got a nametag on, call him by his name. They really enjoy that personal stuff. (Trainer interview, August 28, 2000)

You can kind of tell it because that (customer service) is something that at the college, they really encourage and are really good about emphasizing to us. Putting on a professional image and talking to the customer, wanting to know what's going on. They really emphasize that. You can see the new generation from the old generation. They don't like to. They don't want to talk to them, they don't want to see them. They don't want to do test drives; they don't have time for it. Get them outta here; they're not my responsibility, that's what service writers do. You can see the difference in the way the customer reacts to the situation. You know, given the same diesel pump problem, I'm sure the customer reacted a lot better with me going up there than just a service writer trying to tell them this. The difference is night and day. (Trainer interview, September 8, 2000)

Learning Strategies

In general, the technicians who train CWE students are recognized by their peers and CWE advisors as professional experts. They became experts because they were good learners. Whether or not they ever received formal instruction on effective learning, they were good learners because they approached unfamiliar and different tasks as opportunities to learn. They had followed, perhaps unconsciously, a plan of action to increase their knowledge. They were curious about more than the tasks at hand. They looked for and took opportunities to increase their knowledge and expertise. They were interested in the operational aspects of their companies and in external issues affecting the businesses and their occupations. This sense of curiosity led them to broader investigations and motivated them to learn more about related topics as well as their specialty.

Learning opportunities

Taking advantage of on-the-job learning opportunities meant asking lots of “Why?” “How?” and “What if?” questions and then using available resources to find answers to those questions. There were two parts to this strategy. The first was to recognize situations that had learning potential. These were derived from motivation and curiosity to understand how and why equipment, tools, and processes worked the way they did. An example was the mechanic that asked himself why the bearings on the front left wheel have been replaced twice while those on the front right wheel have never been replaced. Many mechanics would simply replace the bearings while a curious mechanic would look for a reason why one side was wearing out faster than the other.

The second part of this strategy was actually pursuing answers to these questions. This could involve talking to other mechanics, reading manuals, examining related systems, etc. This part also included following tangential questions that arose during the search for an answer to the original question.

One student in particular took the initiative to find out what the whole process is as much as he could. (He did that) by coming in early, asking questions, staying late, and just asking questions, you know. We were all out there so he started asking questions when we had a few minutes of time when we weren't worried about a task or anything else. So that way he could glean a little more from us. (Trainer interview, August 18, 2000)

You need the curiosity factor. I like seeing what makes these things work. For example, VW just came out with this fly by wire that doesn't use a throttle cable. There's a position sensor on the gas pedal and there's a little motor on the throttle. We've seen a lot of problems with them. All the information VW gave us on them is wrong so I had to go in and figure how the system worked. That's

curiosity to me. I like trying to figure out how stuff works and figure out how to fix it. (Trainer interview, September 8, 2000)

The two most common CWE training scenarios were students working with technicians as helpers or trainers assigning tasks or problems to students and then asking students discover the answers. In the first situations, students were directly involved in processes and had the benefit of immediate answers to their questions. In the second scenario, trainers provided enough information so students knew how to begin but had to use heuristic methods to find answers. In both situations, trainers considered themselves as resources, but, while available to answer questions and provide information, they expected students to ask questions.

Ask questions. Come in with an open mind and ask questions. Even if it seems like a dumb question, ask it. I'd be more willing to help you with your questions as opposed to not asking. I can't read your mind. If you don't understand something, please let me know. Don't just sit there. (Trainer interview, August 18, 2000)

Don't be afraid to ask questions. That's the main thing. You know, if you're not getting the answer, ask. I know a couple of the guys were having some problems the other night working on a project and, you know, it stumped them. We was working on an air-conditioning and one of the students was the one working on it. I mean, he brought the book home. And he was studying on that at night trying to figure out what was going on with it. (Trainer interview, August 25, 2000)

Listening and observing are aspects of paying attention. Trainers expected students to be active learners by using their senses to acquire knowledge. Students had many opportunities to add to their knowledge simply by watching and listening to the normal workday activities. Some students consciously recognized these per-

ceptions as adding to their knowledge. At the same time, these perceptions were increasing or adjusting students' tacit knowledge about organizations, work groups, professions, etc.

Be prepared to learn. And listen to everything. Just by listening to what they say, you can learn so much. I mean, just listening to another technician talk, you can learn from it. You'll pick up bits and pieces and you won't even realize it, but one of these days you'll run into a problem and you'll remember him talking about that while we were in our morning break. I mean, you can pick up a lot just listening to people. That's the biggest thing, just keep aware of what's going on around you and listen and just take it all in. (Trainer interview, September 8, 2000)

Solving problems

Another common strategy trainers used to help students learn was solving problems. Trainers posed situational problems to students and then challenged them to use available resources, previous experiences, and their knowledge of principles and theories to solve them. Students appreciated these challenges and felt they learned effectively through this method. The most common approach mentioned by trainers was to give students a real problem, provide enough information about the problem to get them started, and then serve as information resources as the students worked to solve the problem.

A majority of the cars he's working on, I've seen before or one of us in the shop has seen before and we know what's going on with the car. It's real easy for us to say, fix that vacuum line on the back side of the intake manifold, but more than likely we'll ask, "Well, what kind of information you got?" He'll give me his information and it's like, "Okay, you're going in the right direction" or "Well, this code is not really looking for that, it's looking for a vacuum leak." Then go through these steps. You kind of point him in the right direction.

I try to point him where he's going as opposed to just telling him what to do to fix it. (Trainer interview, September 8, 2000)

We'll sit down with them, explain as much as we can so they can understand how to do it, what you're looking for, what it does, what it is and then, basically, we leave them alone after that. If they have questions, they can come to us and we'll go back over it. (Trainer interview, August 18, 2000)

In another common scenario, students worked with technicians to solve problems together. Students learned from the question-and-answer dialogue accompanying the work and the manipulation of equipment and tools. In most instances, students actually did the physical manipulations with guidance by their trainers. This scenario gave students immediate feedback regarding their performance and techniques while the trainers served as a resource to answer "How?" "Why?" and "What if?" questions.

I stop and explain what I'm doing and why. That's one of the things I've learned about trouble-shooting is I have to know how it works and that's everything. And if I know how it works, I can fix anything. But if I don't know how it works, I can't fix it, I can't trouble shoot it. So I try to explain to the student, or anybody that I work with, even the guys here, how it works. That's the key. (Trainer interview, September 14, 2000)

At first they'll work with one of the journeyman through the job until we know what they are competent at doing. And then they are on their own for that end of it. But anytime there's anything new, yeah, they work thru the project with a journeyman. (Trainer interview, August 25, 2000)

Some trainers used a less common but effective strategy of asking questions before and during a problem-solving situation. This strategy forced the student to cognitively explore alternatives and consequences and then verbalize those to the

trainer for criticism before taking any actual steps to solve the problem. This was different from asking questions after an activity. By asking questions ahead of time the student had to think through the process or sequence, mentally explore options, and anticipate consequences. Then, when actually solving the problem, the student's cognitive processes were immediately reinforced by physical actions or the student could see where his or her thinking was not correct. Verbalizing thoughts also enabled the trainer to ask more questions, supplement information, and critique the student's proposed actions. The cognitive aspects of this method were more demanding than situations where a student worked along with a technician and asked questions for explanation during and after the technician had acted. This was a relatively passive information gathering strategy compared to the former strategy.

I'm asking questions all day long. How does this work? What would I do next? What would you do? I mean, I've actually pulled a truck in and said, "This is the complaint; where would you start?" And, I know (a student) is learning by the way he answers and then also the way he works the meters, checks relays, checks circuits and does things like that so I know how he's learning. (Trainer interview, September 14, 2000)

I believe in the theory approach on teaching. You gotta understand how it all works and if you understand, you're okay. Just like this one that came in, this one right here, the cam's bad. The student helped me trouble-shoot it. We went thru the prolink and did the short out of the cylinders and we came up with two cylinders missing. So, I asked the student, "What do those two cylinders have in common?" And, he was searching and searching, so we drew a diagram of where each piston is when number one is firing, where's number two piston at, where's the intake valve, where's the exhaust valve. So, without even pulling the valve cover, we knew we had a valve train problem on the number four cylinder because it had affected the cylinder next to it. Because if you have a valve sticking

open and it's blowing compression back into that cylinder, it goes into another cylinder and causes that cylinder to miss. We had determined that before we even opened the valve cover. But, like I said, I made him draw out where each one was so that he understood it. If you understand, that helps you troubleshoot what's going on. In short, instead of just going in there and saying, okay, I've got two bad cylinders and I'm changing two injectors or whatever, we've got a fault here and a fault here, we ended up finding a bad cam shaft on one cylinder and nothing on the other, but when we fixed the first one, the other cylinder started firing all of a sudden and we understood why. And, that's what it's all about in my opinion. (Trainer interview, September 14, 2000)

Using resources

Although students in this study did not specifically recognize that other people were their most common information and learning resources, their interview comments confirmed that people such as their trainers, shop supervisors, co-workers, college instructors, and CWE advisors were by far their most common resource. The second most frequently mentioned resource was technical manuals and documents. In general, these information repositories provided specifications and information about equipment as well as step-by-step guidance for analyzing common problems and fixing them. While some students appeared to be reluctant to consult manuals, the trainers in this study considered them indispensable for some situations and did not hesitate to use them.

The important thing is to know where you are headed and what you're going to do. If you are not clear in your mind as to what you are going to do, in any way shape or form, don't be afraid to open a book in front of somebody. Period. They have to understand you're there to fix their piece of equipment. You don't want to make mistakes. Sometimes you feel bad about having to open a book and look for something. But okay, but you can't feel that you're going to muddle your way through it. So open a book, find out what you

want to know, and fix the guy's piece of equipment. (Trainer interview, August 11, 2000)

One mechanic had especially strong feelings about the capability to use technical manuals. His response to the question, "What advice do you have for CWE students?" reflected the strength of his feelings.

Oh, man. Go to school! Learn to read! That's the biggest problem we've got. Guys can't read, they can't write. They can't read these books (repair manuals). They can't follow directions. I mean, you get a trouble-shooting tree in a Caterpillar manual that says you're dealing with a specific code or specific problem and it says take step 1, step 2, step 3, step 4, and they're quite thorough, but, if you can't follow those steps, you're not going to be able to solve the problem. . . . You gotta be able to think. And, if a kid can't go to school, in my opinion, and pass English, some math, and writing courses and reading courses, then he could become a mechanic, but he's not going to be one of the top mechanics. It just wouldn't happen. (Trainer interview, September 14, 2000)

CWE Advisors Focus Group

After completing the interviews with students and supervisors and trainers, the researcher convened a focus group with the college CWE advisors to review the validity of information derived from the interviews and solicit reactions, clarifications, and additions to the data presented. Their observations and comments pertaining to student social and learning strategies were grouped into five categories.

Safety

Advisors emphasized safety and expressed strongly that a safe environment was their top priority in placing CWE students. While several supervisors

mentioned safety, advisors felt some supervisors have accepted or inadvertently overlooked unsafe conditions through inattention and long-term practices.

That's one of the things that has changed in the industry. I know when I first got into it, safety wasn't as important as it is now. But I think all of us train our people to be professional. Part of being a professional is knowing that if you get hurt, it cost the company money. Even if you don't really care, even if you are invincible. (CWE advisor #3, December 12, 2000)

Very few of the other programs have the safety concerns. I can't, in good conscious, send a student out to a work site without going out and seeing what they do there, looking at it. I may send them out once, but I don't let them stay out there very long without me going and looking at it. (CWE advisor #1, December 12, 2000)

Motivation to Excel and Desire to Learn

Advisors confirmed that motivation to excel and desire to learn were the two most important characteristics for CWE students to have and demonstrate. They considered these two traits essential for establishing candid relationships and maximizing learning.

Something we hear at every program advisory meeting is about having employees show up with a fire in their belly to do the work, a passion for what they do. I think I've heard it at every advisory meeting. We hear that over and over again. It's okay to learn to do a job, but try to be excited about it. If you're not excited about the profession, if you're in it to make a lot of money in electronics, maybe you ought to be somewhere else because the amount of work required requires that they be excited about it. (CWE advisor #4 interview, December 12, 2000)

The ones that aren't excited aren't going to make it. You gotta want it or it's not going to happen. In all these vocations, there's just too much work involved. You're going to enjoy it or you're going to have to bounce down the road.

You almost have to want to do it enough that you would do it even if it didn't pay well. You need to have that motivation. (CWE advisor #5 interview, December 12, 2000)

Feedback on Learning

A learning strategy some students and trainers mentioned was feedback at the end of a task, project, or workday as an opportunity to review problems and solutions, to get answers to questions that came up during the day, and to see if the training process was working for students. CWE advisors lamented lack of time to do adequate reviews with students but recognized their importance.

I think that something that could help us, but it is really difficult to do because of time constraints, would be some sort of a check in the middle, more of a check-in process than we are doing now because I think, in order to make clear what they need to pick up, I don't think they really know what you're talking about until they get out onto a site. I think once they're on a site, you have a better chance of saying, and I do this a lot, but probably not enough, "Well, how is it going out there? What did they have you do last week? Do you think you could do something better?" Those types of things. (CWE advisor #3 interview, December 12, 2000)

Some feedback while they're doing it is important because I think that, if you want them to get the maximum from it. I think they have only this real vague idea of what's going on when they sign the papers and first show up. I think a lot of that has to take place after they have been on the site and kind of get the lay of the land and what's happening. (CWE advisor #3, December 12, 2000)

Dress and Work Ethics

Advisors expected that appropriate dress would have been rated highest on a questionnaire administered to supervisors and trainers. After discussion, the

group agreed proper attire might be considered a basic entry requirement for accessing a work site. They decided work site supervisors expected CWE advisors to address and resolve dress and work ethic issues before referring students. They compared work ethic issues to drug tests that were considered prerequisite to employment in many vocational shops. The advisors did not conclude supervisors believed work ethics were less important, but agreed that they were a continuing issue for college advisors and instructors as well as work site supervisors and trainers.

Sometimes you take some things for granted when you send students out there. We always talk about work ethic but the idea of the clothing and some of these things, I have just taken for granted. Maybe because I have seen the students in the classroom and I know that they dress appropriately for the classroom, I'm assuming they're going to dress the same for work but I shouldn't be making that assumption. (CWE advisor #4, December 12, 2000)

One of the comments I get back from a lot of CWE supervisors is the work ethic isn't very good. And you go, Okay, did you explain that or talk to him about it? Yeah. Well, so did I. Let's hope one of us got through to him. We've got them for seven quarters. Mom had him for 21 years. Now we got him for 7 quarters, and I can't change those 21 years over night. So, yes we'll do the best we can but don't expect us to take some lazy kid off the street and turn him into a "I want to be a mechanic" mister gung-ho every time. (CWE advisor #1, December 12, 2000)

I had an employer who let a student go right away because he wasn't dressed correctly. He didn't have a lunch with him and he was going out to the boondocks and he showed up late, but the biggest thing was that the guy didn't feel like he was there with appropriate clothing. From our point of view, I think safety, not neatness, you know not having all chains hanging down and all that. (CWE advisor #3, December 12, 2000)

Advice from CWE Advisors

A question asked of the CWE advisors was “If you could impart three things into the brain of every CWE student, what three things would you tell them?” These are some of the answers. (Focus group with CWE advisors, December 12, 2000)

“Situational awareness. You can get killed out there. That’s right off the bat what we tell them in our trade.”

“Honesty. Be honest about it. If you don’t know, ask. If you do know it, do it. Don’t try to BS your way through life because it’s never going to work in a vocational field.”

“Be independent. Go out there with the understanding that a supervisor won’t always be there and you’ll have to take some initiative and they’ll expect you to.”

“A passion for what they do. A life-long learner and good work ethic.”

“Show up on time, be safe, and ask questions.”

“Don’t be afraid of the industry. Let the industry help you to learn. But I find honesty the big thing. Don’t go out there and BS with these guys. If you don’t know it, don’t dive in there and get somebody hurt, yourself or somebody else or break something. Stop and ask a question and be honest. “Hey, I don’t know this.” They’ll be more than happy to come help you and then you will know it and you can move on. Dishonesty is the fastest way to kill yourself in any trade.”

“Be versatile. Versatility and taking advantage of those learning opportunities when they come up.”

Other Observations

Trainer Interview Questionnaire

At the beginning of every interview with trainers, the researcher asked the respondent to complete a questionnaire (created by the researcher) regarding work ethics and behaviors. The primary purpose of the questionnaire was to focus the interviews on students' social and learning behaviors and away from discussions about their technical preparation. Since all of the items were positive behaviors, the questionnaire was not intended to find significant differences between the items. The results of the survey simply confirmed that supervisors and trainers believed work ethics were important. Respondents were asked to rate the items on a scale of 1 to 5 with 5 being the most important. All but two of the items received an average score of 4.17 or above. One respondent asked permission to use the survey as a checklist during his orientation of new employees. Below is the survey with the items arranged according to the rankings provided by supervisors and trainers. The average score is in parentheses.

1. (4.92) Ask questions for clarification.
2. (4.83) Be on time and mentally and emotionally ready to work.
3. (4.83) Pay attention to instructions and advice.
4. (4.75) Have a positive attitude toward training and the work to be done.
5. (4.75) Know safety practices and watch for unsafe situations.
6. (4.67) Behave appropriately for the work setting.
7. (4.67) Accept responsibility for assigned tasks.
8. (4.67) Be respectful of other employees and customers.
9. (4.58) Show initiative. Look for obvious things to be done.

10. (4.58) Be cooperative and participate in group work/activities.
11. (4.58) Let the trainer know if you will not be there as scheduled.
12. (4.5) Let the trainer know when you have completed an assignment.
13. (4.42) Check with the trainer before trying a different or new procedure.
14. (4.25) Be dressed and groomed appropriately.
15. (4.25) Ask for feedback regarding performance.
16. (4.17) Ask questions about procedures and reasons for them.
17. (3.83) Talk about and review what they have learned.
18. (3.83) Ask for clarification and explanation about comments made by other employees.

Several supervisors expressed strong feelings about the second item on the questionnaire: Be on time and be mentally and emotionally ready to work. This behavior was extremely important to some trainers and a deciding factor for them regarding continued employment. For trainers, being on time and ready to work was a student's first daily opportunity to demonstrate commitment. The attitude was, "If a student said he'd be here, then I expect him to be here or let me know ahead of time that he's not." The following were typical comments by trainers about being on time for work.

I'm death on being late and that's the problem with most young employees. I tried a couple young employees and I fired both of them because they couldn't get to work on time. This one guy was always on time by a minute or two. He had it down pat that he was pulling in the driveway at two minutes 'til. He'd be here at two minutes 'til and he'd be dragging his butt out of the car and drinking coffee and eating a donut and I'd say, "Okay, let's get to it," and he'd say, "Well, I gotta finish this." No, not on my time. Now, he's getting another job in a look-busy place. It's too bad because he had an opportunity to practice what he'd learned in class. (Trainer interview, November 8, 2000)

One thing he was great at, he'd showed up on time every day. And I'm a real stickler about that. I tell guys when I hire them, you get three chances. You're late three times and you're fired. I don't care how good you are or how bad you are, you're late three times, you're out. (Trainer interview, November 8, 2000)

Trainers' opinions about appearance and grooming varied, but, in general, they expected employees and students to be dressed appropriately for the work setting.

Their basic appearance, you know, they don't have to be—they don't have to have short hair, a crew cut or styled hairdo's or whatever, but just a basic appearance. I mean I was raised in a family where we didn't have much, but we always knew one thing. You don't have to be rich to be neat and clean. (Trainer interview, August 28, 2000)

Be dressed and groomed properly but that's kind of an either side of the fence kind of thing. We don't have any problem with long hair and beards or anything else, but being dressed properly is important. It's a real casual shop because we don't deal with customers. We don't see customers for weeks at a time or they may never see a customer at all. So being dressed is not as important as being ready to work. (Trainer interview, November 10, 2000)

Miscellaneous Observations and Comments

Evidence that students were learning

A question asked of trainers was, "How do you know a student is learning?"

In general, trainers believe students showed they were learning by demonstrating better skills and bringing more knowledge to solve problems. Comments by trainers conveyed an appreciation for student learning.

The students got better. Yeah. There's a definite improvement in the technical aspects. As far as the welds they made. There's certain things come out in the work, the paperwork, to build the transformer. There's discrepancies from one drawing to another. It gets the point

that, rather than having to hunt somebody down, you know, they would know what to do and know that they were doing the right thing. (Trainer interview, August 21, 2000)

You could almost see the light bulb going on over their heads when they finally understand, “Oh, wow, that’s how that works!” “That’s what that does.” . . . They had the theory down, especially something they’d never seen in practical use. When they saw something in practical use, it was, “That’s why I learned that.” And it showed. You could see it and it would go from there. (Trainer interview, August 18, 2000)

Adapting to a work environment

Every CWE work setting was different. While many students were familiar with various work settings, CWE advisors and work site trainers advised students to be mentally prepared to adjust to different environments. Trainers did not judge their work environments but rather talked about them as facts of life to which new employees and students must adapt.

For the most part, the shop kind of works out there on a dog-eat-dog deal. If you’re not—if it’s not quite right, somebody is gonna let you know about it. It’s not a mean way, but everybody helps everybody out. And they got plenty of feedback. (Laughs). They’ll be teased relentlessly. You get plenty of feedback. It’s a good-natured thing, but that’s just kind of the way it goes. I mean, I’ve been doing this a long time and it’s always been that way everywhere I go. You know, when a new guy comes in, and, man, he’s the target, and you’ll have every nasty, rotten little trick that you can think of pulled on you. And that’s just kind of the way it is. (Trainer interview, August 21, 2000)

In a shop where we work by yourself probably 90% of the time, we don’t have a sweeper, we don’t have a shop clean-up boy. Guess what, you’re going to do it yourself. You’re going to take a part off, you’re going to take it over, you’re going to wash it, you’re going to do the paper worker. Right now. And that’s what I think the college should be mentioning. I know (the CWE advisor) says these guys

are all fired up to come out and think they're going to be hotshot mechanics. I'll tell you now, as soon as they get to a shop, there can't be any complaining. I don't want to hear any whining. This is what we do. If I got something to wash, then I'm going to wash it. Whatever it takes to get the job done. That's the real world.
(Trainer interview, November 10, 2000)

One CWE advisor noted that some students learned from their CWE experiences that they really were not interested in a particular line of work. In these cases, students were able to make career decisions prior to completing a program.

Similarities and differences

Based on the interviews, students and trainers made similar points about social and learning strategies important to successful CWE experiences. Both groups talked about the importance of positive attitudes, motivation to learn, and good work ethics. Comments by the participants revealed two significant differences between the two groups.

1. While students discussed work ethics, curiosity, motivation, and attitude toward work in terms of learning and employment, trainers considered these from a more personal perspective. They viewed these as indicators of respect and commitment to learning and excellence.
2. Generally speaking, trainers have a "fire in the belly" that motivates them to work hard, take advantage of learning opportunities, and strive to be exceptional technicians. Students were more focused on technical

expertise and most did not demonstrate the passion to excel the researcher perceived as common among supervisors and trainers.

These differences reflect different levels of emotional involvement between students and trainers. For trainers, their occupation is a life's chosen work. Students had different priorities at this time in their careers. Several students reflected that they were more motivated and excited about their career choices after completing a CWE than they were before the experience.

CHAPTER 5

FINDINGS AND RECOMMENDATIONS

Employers often lament that many American workers are not qualified for present and future jobs due to changing skills requirements and deficiencies in schools (Darrah, 1994). A 1991 report by the Secretary of Labor's Commission on Achieving Necessary Skills (SCANS) concluded that most young people leave school without the knowledge or foundation skills to find and hold good jobs. According to the report, schools are not producing enough people with basic workplace competencies required to meet the demands of today's highly interactive and technical workplace and employers have not accepted responsibility for human resources development. The report called for educators to change instructional strategies and use workplaces as learning sites (Taylor, 1995).

Cooperative work experience (CWE) does just that. In a typical CWE, students spend periods of time engaged in productive work related to their field of study. Ryder (1987, p. 2) described CWE as "experiential learning in which students engage in institutionally-sponsored productive work that is integrated into students' academic program curriculum."

Many community college professional/technical programs require or strongly recommend work experience as part of curriculum requirements. As outcomes from work experiences, students expect to develop a professional identity, grow personally, improve their employability, and clarify career goals (Page et al.,

1981). Employers consider student work experiences as opportunities to recruit prospective employees, accomplish challenging and practical work, assess future employees before hiring, and improve relations with a college (Weinstein and Wilson, 1983).

Complexity of Cooperative Work Experience

For CWE students, learning on a work site is complicated. Students must adapt quickly to several roles, all of which may be new to them. At the same time they are trying to fulfill learning objectives from their college curriculum, they also must adapt to new work settings (organizational socialization) and learn skills, knowledge, and attitudes of a new profession (occupational socialization). To benefit from these complex situations, CWE students use a variety of strategies to learn from the opportunities each unique work setting offers. Given this situation, and the temporary nature of most CWE assignments, students need to have and use attitudes, behaviors, and social skills to adapt quickly to new work environments and effectively interact with and learn from trainers, supervisors, and other employees.

Purpose of the Study

The purpose of this study was to identify and describe social and learning strategies male community college students use to maximize their learning from cooperative work experiences. The study answered the following questions:

1. What learning strategies should students use to take maximum advantage of the learning opportunities available during their workplace experiences?
2. How do students recognize on-site learning opportunities?
3. Are there specific attitudes and behaviors students should have and demonstrate to be accepted by their CWE trainers and other employees?

Findings 3 and 4 answer the first two questions that pertain to students' responsibility for learning and learning strategies. Findings 1 and 2 address the third question.

Methodology

The methodology for this study approached these questions from two perspectives: students and trainers. Data were collected by in-depth, open-ended interviews with ten CWE students and fourteen trainers in five professional/technical programs at a mid-sized community college in southern Oregon. Interviewing students as well as trainers enabled the researcher to detect consistencies and inconsistencies between the two groups regarding their explanations and reasons for attitudes, beliefs, and behaviors. As an example of an inconsistency, students viewed good work ethics as an employer's expectation regarding work behavior whereas trainers considered work ethic an indicator of students' commitment to excellence.

After interviews with students and trainers were completed, a focus group of CWE advisors for the five programs reviewed the data for content validity. This focus group provided an opportunity for these advisors to add information and opinions about data and served as a method for determining if further research was necessary.

Data analysis during the study revealed that social strategies and learning strategies are two distinct dimensions. The first dimension is the social strategies students use to establish and maintain effective relationships with their trainers. The second dimension, learning strategies, is an intersection of the perceptions of students and of trainers regarding the most effective strategies students use to access trainers' expertise and knowledge. Four findings emerged from analysis of data:

Finding 1: A candid and respectful relationship between student and trainer must exist before the trainer will share fully his expertise and knowledge with the student. The student has primary responsibility for establishing and maintaining this relationship.

Finding 2: The effort a trainer is willing to expend on training reflects his perception of a student's eagerness to excel and willingness to work hard.

Finding 3: Students have primary responsibility for managing their own learning during work experiences.

Finding 4: Students should use four learning strategies to maximize their learning from cooperative work experience:

- a. Apply cognitive apprenticeship processes
- b. Solve problems
- c. Recognize and pursue incidental learning opportunities
- d. Practice technical skills

Discussion

Finding 1: A candid and respectful relationship between student and trainer must exist before the trainer will share fully his expertise and knowledge with the student. The student has primary responsibility for establishing and maintaining this relationship.

Cooperative work experiences are social learning situations where students must adjust to their roles as new employees at the same time they are adjusting to new or different organizations and occupations. Students enter CWE situations as new and temporary employees asking for a trainer's time and expertise. Trainers believe students are obligated to adjust their behaviors and adapt to the work routines and procedures of the business.

A form of power relationship exists between trainers and students. Trainers know they have knowledge and expertise students need and students know they need access to the trainers' knowledge and expertise. To fully access trainers' expertise, students must be personally accepted by their trainers. Getting to acceptance means first establishing relationships such that the trainers believe devoting time and energy to teaching the students is a worthwhile investment of time they

could otherwise devote to productive work. CWE students, therefore, must affirm the trainers' beliefs by having and demonstrating attitudes and behaviors expected and deemed appropriate by the trainers and other employees. Similar to the inclusionary boundary (Van Maanen and Schein, 1974) new employees must negotiate to become accepted members of an organization; students must negotiate an inclusionary boundary with their trainers. Students must know and use social strategies to establish and maintain open, honest, and respectful relationships with their trainers. If students believe they are using appropriate strategies while their trainers view those behaviors or attitudes as inappropriate, the relationships may be negatively affected and the students may not be able to take full advantage of the training opportunities.

My guess is (a work experience is) more of an opportunity for them to learn about the guys out here. How to socialize. These guys are pretty harsh out here. You walk in and act like you know something, they going to watch you drown. You know these guys have been doing it for 50 years. So, humble yourself, you know, 'til you got a few years, listen, talk. These guys will take you under their wing and they'll teach you. Just learn how to get along—it's so important to learn to get along with these guys around here so they'll take you in. Otherwise, yeah, it's going—they can pretty well isolate a person who – they'll deal with these guys who come in with an attitude. They'll just—it's kind of a bad deal when you can't get along with people. These guys can isolate you in a hurry. So, it's very clear that it's most important to learn to get along with these guys.
(Trainer interview, August 28, 2000)

Attitudes

Trainers expect students to have positive attitudes about work and learning. They expect students to be highly motivated and eager to learn. They also expect

students to want to be the best technicians and employees possible. While some trainers said being liked by students was not a concern, they expect students to respect their knowledge and technical skills.

Respect is a key element of the relationship between trainer and student. This relationship is the foundation for accessing trainers' knowledge and skills and consequently maximizing learning from a CWE. Students can convey respect through many behaviors. For example, students show respect through attentiveness to what trainers have to say, the sincerity and pertinence of their questions, their willingness to be helpful and supportive, by showing eagerness to learn, and by demonstrating good work ethics. Trainers also expect students to respect the hierarchy among employees and their positions in the company.

For a mechanic, one-on-one, respect is important because, for me personally, I have to respect the guy's knowledge that I'm helping or that I'm working with, and know that he'll be as thorough as I'm going to be. As far as, if the student doesn't like me, it really—that's the student's problem, because in this world of mechanics, when he leaves school and goes to a shop, he's not going to like a lot of the guys he works with, but he's got to learn to deal with that. (Trainer interview, September 14, 2000)

Behaviors

CWE trainers are knowledgeable, highly skilled, motivated to excel, and willing to work hard. They set high performance standards for themselves. They take a strong work ethic for granted and assume students will do the same.

While students view *work ethics* as an employment issue, trainers tend to consider a student's work ethic as an indicator of the student's respect for them as

individuals. Trainers view students' training as a shared commitment. Therefore, if a student does not show up on time or is not fully engaged and attentive, the trainer may see this as failure by the student to share the trainer's commitment. As a result, the trainer may take the student's action as a personal affront. Trainers expect and respect students' willingness to work hard, commitment to learning, and determination to excel.

Trainers expect students to *pay attention* and do as they are told. When speaking of paying attention, trainers often included a broader perspective than just listening to instructions. They referred to broader operational and organizational issues such as how contracts and work schedules are developed and coordinated. They believed paying attention to broader issues enables students to learn how their particular jobs fit into the overall operation of a company. Simply exposing a student to a range of situations does not guarantee learning. Students must attend to or pay attention to be able to recognize and differentiate distinctive features of an event or activity (Bandura, 1975, 1976, 1978).

Listen, pay attention watch, don't space out. Be there, be present. Develop a desire to excel because if you don't have that, you might as well work at Taco Bell or do something else. You just have to have a hunger for knowledge. Just to be open and try to do the best you can all the time and don't let up. Try to see the bigger picture, not the little picture. (Trainer interview, November 10, 2000)

Teamwork is highly valued by trainers and supervisors. While technical work may often be done independently, the ability to work together cooperatively, share information, solve problems, and contribute to a pleasant and effective

working environment is vital to a successful operation. Some supervisors said being able to work cooperatively is equally important as having good technical skills.

Trainers consider these behaviors especially important demonstrations of students' efforts to establish and maintain effective relationships. Students must show these attributes to be accepted and gain full access to the expertise and knowledge of the trainers and their co-workers.

Finding 2: The amount of effort a trainer is willing to expend on training reflects his perception of a student's eagerness to excel and willingness to work hard.

They were eager to learn, to listen. They asked good questions and they listened to what I had to tell them. . . . You want to see the initiative; you want to see that they want to learn. I don't even know how to explain it, but I've been doing this long enough that I can see a guy pretty close to right off that really wants to show you something or really wants to learn. He may be a bit hesitant on how to do it but he wants to learn how to do it as opposed a guy who—"This is heavy, I don't like this job" (whining). He can go find another one. (Trainer interview, August 21, 2000)

While trainers are interested in helping students learn, their commitment to students' learning generally reflects their perception of students' commitment and motivation to learn and become excellent technicians. When students enter work sites to begin working, trainers immediately begin assessing their attitudes and behaviors as indicators of commitment and motivation to learn, work hard, and excel. They then decide, based on their perceptions, how much of their time and

energy they will devote to training. In other words, the trainers established the conditions of social contracts with the students (Watkins and Marsick, 1992).

For good technicians, to excel is more than learning to do a job well. For them, to excel includes a strong motivation to learn and become knowledgeable about many aspects of the profession, willingness to make the effort and take the time necessary to develop expert technical skills, and being dedicated to doing high quality work.

In general, CWE trainers are excellent technicians. They earned their credentials through personal motivation to learn, hard work, and by setting high performance standards for themselves. As primary sources of information and guidance, they expect to be respected for their knowledge, skills, and expertise. They believe students show commitment to becoming excellent technicians through certain behaviors such as eagerness to learn and willingness to work hard.

When I was an apprentice, I was there the first one every morning and the last one there in the evening. If there was a job there that I was interested in learning about that somebody else was doing, I stayed after my shift to observe. I did that on my own. I wasn't paid for it or nothing, but that was just me. (Trainer interview, September 14, 2000)

I think the school really needs to impress on someone when they come into this class, that this is a backbreaking job and if they aren't willing, they shouldn't even attend. I've been in this since I was 17 and I started at the bottom. That taught me right now that you're going to go home tired and dirty every day. If you're not ready to work and sweat and go home tired everyday, then get out. If you don't want to learn the trade, you shouldn't be there. (Trainer interview, November 8, 2000)

Although trainers provide opportunities for students to learn and practice technical and social skills, students' attitudes and behaviors directly impact the quality of training they will receive during CWE. Several of the students interviewed did not seem to share the high level of dedication to excel or show a willingness to work hard that their trainers know are essential to success and expertise. Students did not seem to recognize the difference between working hard to learn a job and working hard to excel. Consequently, they did not have the benefit of their trainers' full range of expertise and knowledge and missed opportunities to learn from their experiences.

Finding 3: Students have primary responsibility for managing their own learning during work experiences.

There are two aspects of this finding. First, CWE trainers are employees paid for the work they do for the company. Their first priority is productive work. Training students is secondary. Given situations where work needs to be done, the trainer will give priority to getting the work done. Therefore, students must assume primary responsibility for managing their own learning, but some students may not be aware of this responsibility. Having been in classrooms where instructors share responsibility for student learning, CWE students must adjust to situations where trainers (teachers) have other priorities. Although trainers will help, students must find the right balance between learning/training and productive work. Since every work situation is different, students may work closely with trainers or work inde

pendently. In either case, students must assume responsibility for finding the work and training patterns most effective for them. As adult learners, students must become self-directed learners (Brookfield, 1985; Spear and Mocker, 1984).

Secondly, most work site trainers are very knowledgeable, highly skilled, and motivated to train students, but are not trained as instructors. The student needs to know and be able to use learning strategies that draw from the trainer's expertise and enable the student to organize and assimilate information and knowledge.

Most students are aware work experiences present many opportunistic learning situations but they do not always recognize or know how to take advantage of them, or are not motivated to pursue them. To truly make the most of a work experience, students must take advantage of learning opportunities as they occur. As one student put it,

You gotta be real motivated and you got to take a lot of responsibility. Start taking a lot of initiative. You can't just show up for work every day and do your job and go home and expect to go anywhere. I did a lot of digging. I'd take things apart and look at them if I had a chance. Did a lot of reading. (Student interview, August 28, 2000)

Trainers and supervisors believe students are primarily responsible for their own learning. Because they are interested in training students for reasons such as recruiting and assessing future employees and accomplishing practical work (Weinstein and Wilson, 1983), they take time to provide training. In return, they expect students to make the efforts and adjustments necessary to balance productive work and training.

Finding 4: Students should use four learning strategies to take maximum advantage of CWE learning opportunities:

- a. Apply cognitive apprenticeship processes**
- b. Solve problems**
- c. Recognize and pursue incidental learning opportunities**
- d. Practice technical skills**

Conti and Fellenz (1991) defined learning strategies as techniques or skills an individual elects to use in order to accomplish a specific learning task. Strategies differ from learning style in that they are techniques for learning rather than stable traits and are selected for a specific task. They vary by individual and learning objective. Students who know how to use effective strategies to monitor their learning, memory, and information processing can take greater responsibility for their own learning and become more adept in achieving their individual learning needs and goals (Weinstein, 1982).

Students described the following four strategies as being effective for them. Other strategies and techniques students said they used were more effective when applied in the context of a broader strategy such as cognitive apprenticeship. For example, Bandura (1975; 1976; 1978) says that by observing behaviors modeled others, a person can learn new behavior patterns and the consequences of that behavior without actually imitating the behavior. The students in this present study would qualify this strategy with, “Yes, but, I learn better if I watch and then do it myself or try to figure it out myself.” The four learning strategies identified are

those that students perceived as most effective for maximizing experiential learning during a CWE.

a. Apply cognitive apprenticeship processes. Collins et al. (1991)

describe traditional apprenticeship as having four steps:

1. modeling or observing a master demonstrate the task
2. providing an outline or sequence of the process, necessary information, helpful tips, and advice that serve as a cognitive scaffold for the process
3. fading or giving a student more responsibility for completing the task or project
4. coaching and providing motivation, support, feedback

Collins et al. cite observation as key in that it provides a conceptual model of the overall process, enables a student to identify advanced organizers or critical steps and checkpoints, provides a frame of reference for feedback and advice, and serves as an internal guide for independent practice. Cognitive apprenticeship (Duncan, 1996; Cash et al., 1996) adds verbalization to this process to bring the instructor's thinking to the surface and make it audibly visible to students. By articulating thought patterns while performing tasks, instructors make visible their thinking about parameters, sequences, problems, options, decisions, key indicators, standards, etc. Bringing these tacit processes into consciousness helps students to understand the thought processes underlying the modeled actions. Thinking aloud enables instructors to describe situational analysis and factors considered while

they perform a task or operation, explain why they are doing it, and verbalize their self-correcting processes.

As students work along with trainers, they ask questions about the tasks or problems at hand. Conversely, some trainers ask questions of students. In both situations, the goal of questioning is to cause persons, trainers or students, to verbalize their cognitive activities as they work through or plan to work through processes or problems so that this cognitive activity can be analyzed or assimilated. Working together or in close proximity with a trainer provides students immediate access to their primary information source. Students also benefit from immediate feedback from the trainer or supervisor so that they can adjust behaviors or techniques. The most important aspect of these exchanges between trainers and students is the opportunity for students to examine thought processes, theirs and the trainer's, so they have cognitive frameworks for processes and understand reasons for actions and decisions.

Using cognitive apprenticeship strategies is appropriate for problem situations as well. Articulation of thought processes and patterns is the most important aspect. According to Johnson and Chung (1999), "The purpose of verbalization during the process of problem solving is to make the individual's inner thoughts explicit. The verbalization of inner thoughts reveals thought patterns and brings subconscious thought to consciousness, allowing the problem solver to monitor his or her chain of reasoning and identify errors."

b. Solve problems. In this study, all of the participants considered the ability to solve problems crucial to success. Solving problems challenges students to draw on previous experience and knowledge of principles and apply them logically to resolve an anomalous situation. As a learning strategy, the process of solving a problem forces students to evaluate and analyze situations and mentally anticipate consequences of a variety of actions in a logical sequence. Concrete actions result in another situation in a sequence of situations and add to the student's information and experience base. Solving a problem could be described as a series of questions to which a student or technician must find answers. The problems students confront are the concrete experiences of experiential learning (Kolb, 1984; Pfeiffer, 1988).

In addressing a problem or a series of problematic situations, students must first determine possible actions and then anticipate outcomes and consequences of each possible action (see Figure 4). To do this, they bring to bear: (a) knowledge they have acquired based on previous experience; (b) knowledge and understanding of principles and theories; (c) pertinent information derived from documents and other people: trainers, supervisors, other employees, etc.; (d) their understanding of the physical parameters such as location, time, and resources (tools, equipment, and materials); and (e) their personal values as well as organizational and occupational values as they interpret them.

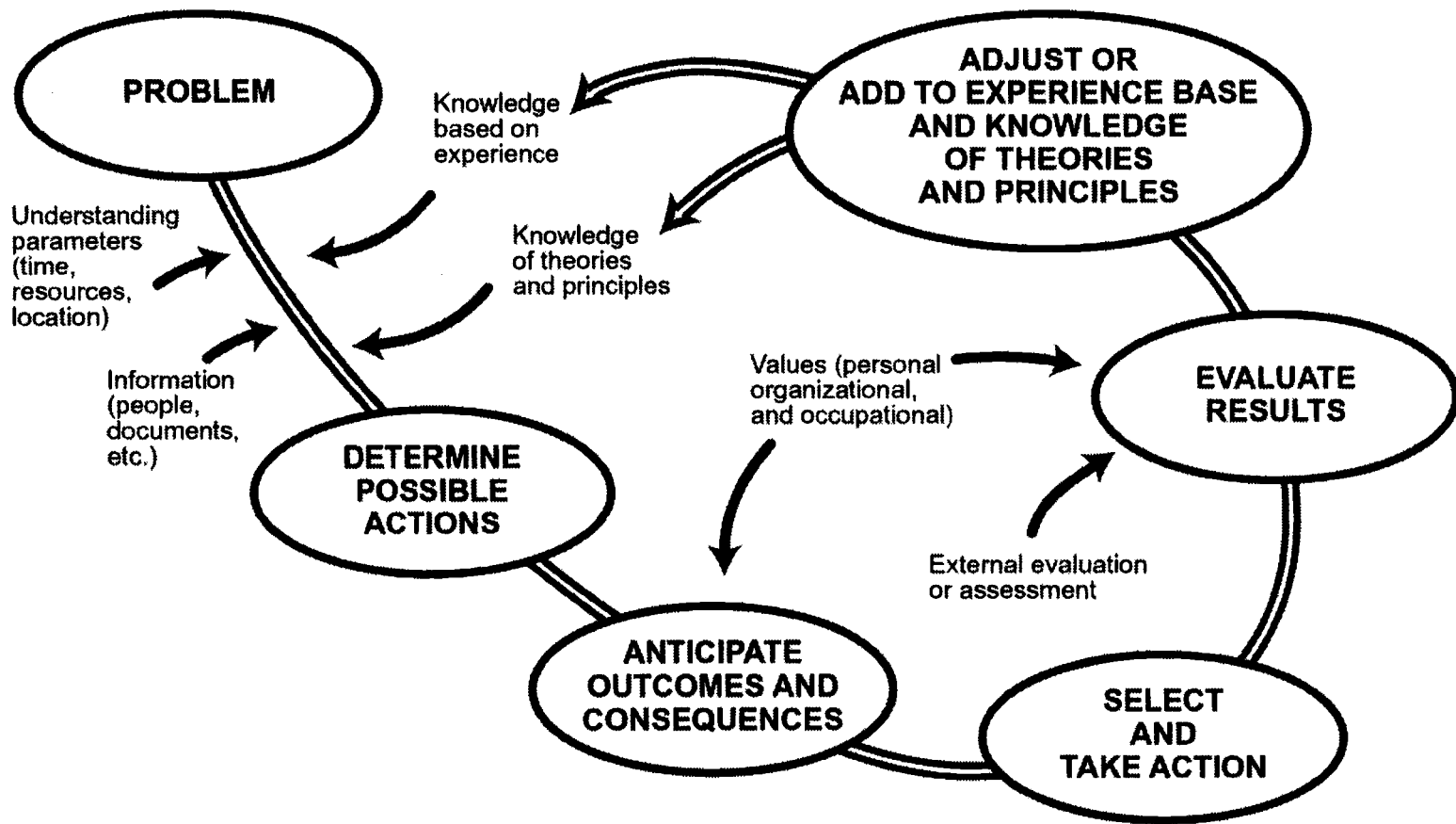


Figure 4. Solving problems to increase knowledge (Risser, 2001).

After selecting and taking an action, students evaluate the results in terms of progress toward a solution to the problem and against their personal, organizational, and occupational values. Frequently, they have the benefit of an outside evaluation by a trainer to help judge the results. As students in a new occupation, they may lack the occupational and organizational values that come from experience on a job. The external evaluation of their problem solution decisions by trainers or other employees becomes an important aspect of students' socialization processes.

Students learn by adding to or adjusting their experiential knowledge and reinforcing or adjusting their understanding of theories and principles. For the next similar problem, their experiential knowledge and understanding of theories and principles have been enhanced by the results of the previous problem-solving activity. In this manner, solving problems enables students to construct a broader experiential base, which they can bring to bear on future problems.

The problems that CWE students solve may be posed by their trainers, come from an assigned task or project, or be generated by their own curiosity. According to Lewis et al. (1998), when a trainer poses problems or asks questions of the student, the student shifts from being a relatively passive recipient of the trainer's knowledge and approach to solving problems already identified by the trainer to being actively involved in identifying problems and finding solutions. The trainer's role becomes that of a resource and a co-constructor of knowledge as students actively create knowledge in the process of seeking solutions.

c. Recognize and pursue incidental learning opportunities. Through the many facets and activities of a typical production environment, workplaces offer many opportunities to learn about social as well as technical aspects of professions and organizations far beyond the learning objectives established by a college program curriculum. Dewey (1938/1997) referred to this as collateral learning. Ross-Gordon and Dowling (1995) described incidental learning as “a spontaneous action or transaction, the intention of which is task accomplishment, but which serendipitously increases particular knowledge, skills, or understanding. Incidental learning, then, includes such things as learning from mistakes, learning by doing, learning through networking, learning from a series of interpersonal experiments” (p. 315).

CWE trainers become professional experts because they are good self-directed learners. They recognize and take advantage of incidental learning opportunities that occur during work. They are good learners because they are curious and approach unfamiliar tasks as challenging opportunities to learn. They follow, perhaps unconsciously, a plan of action to increase their knowledge and expertise. They are curious about more than the tasks at hand. They are interested in their organizations, professions, and other activities affecting the business or occupation.

Taking advantage of incidental learning opportunities means asking lots of “Why?” “How?” and “What if?” questions and then using available resources to find answers to these questions. Incidental learning may begin with questions about anomalous situations— a broken spring, a malfunctioning oscilloscope, or a

welding rod that melts too quickly. Anomalies become experimentation processes where students draw upon their experience and knowledge of principles to try to learn why they occurred. Incidental learning may begin as the result of a simple question about how a particular piece of equipment works or another employee's comments about his rights according to a union contract.

There are two parts to this strategy. The first is to recognize situations having learning potential. This is derived from a sense of curiosity and motivation to understand how and why things (equipment, tools, policies, processes, etc.) work the way they do. While work sites may offer hundreds of opportunities to ask "Why?" "How?" and "What if?" questions, trainers would suggest students initially focus on tasks, equipment, and tools related to their jobs. By developing a core of knowledge in one area, students have a base of information upon which to build as they explore related areas and topics.

The second part of this strategy is actually pursuing answers to these questions. Frequently, students will accept cursory answers without seeking answers for themselves. By using available resources such as other technicians, procedural manuals, and related systems, students can find answers for themselves. This strategy includes following other tangential questions arising during a search for an answer to the original question.

d. Practice technical skills. Students and trainers recognize two elements important to practicing as a learning strategy. First, students recognize that repeating a physical process improves motor skills and manual dexterity and

enhances retention of processes (Weinstein and Mayor, 1986). For such activities as laying a true bead in welding or making a straight cut in sheetrock, the only way to become more proficient is through repetition of motions. As one student said, “You need practice doing things. I suppose it’s just like playing baseball. You need to keep practicing to stay good.”

The other element of practice is to broaden one’s experience base (Foster, 1986). A benefit of practice in a realistic environment is that seemingly repetitious tasks frequently have variations. For example, a curved window frame may require a different technique for cutting a piece of sheetrock to fit properly, or a softer piece of steel may require a different technique for laying a welding bead. The more variations students encounter, the broader their experiential base will be and the better they will become at performing tasks required of their chosen occupation.

Recommendations

For faculty CWE advisors and instructors: The findings from this study should be incorporated into curriculum used to prepare professional/technical students for work experiences. Additionally, this information should be given to and discussed with students prior to beginning their work experiences. To maximize their learning, students need to recognize their responsibilities for establishing and maintaining effective relationships with trainers and for assuming responsibility for their own learning. They also need information about learning from technicians by using effective learning strategies.

CWE advisors need to provide feedback regarding the effectiveness of training to supervisors and trainers as well as students. Several of the trainers in this study expressed desire for this feedback so they could improve the quality of their training.

For students: Since the focus of this study was to identify strategies students use to maximize learning during cooperative work experiences, the findings provide important information for students preparing for a CWE. Three previously mentioned concepts are especially important for CWE students to understand.

1. A candid and respectful relationship with the trainer is the key to maximizing learning. The more open, honest and straightforward the relationship the student establishes and maintains, the more time and energy the trainer will devote to sharing knowledge and teaching the student.
2. Trainers consider a student's work ethic to be an indication of the student's commitment to training. A student's breach of work ethic is often taken as a personal affront by trainers.
3. Trainers expect students to want to excel in their occupations. For trainers, to excel is more than learning to do a job well. Trainers define excel as having a compelling drive to be an exceptional technician, taking advantage of learning opportunities, and developing technical expertise.

For trainers: During data collection, the researcher recognized a concern of several trainers who said they wanted to provide good training but did not believe they knew how to train students effectively. They had not received feedback on the

quality of their training from either students or CWE advisors. To address the trainers' concern, the researcher developed a guide for "Effective Training Techniques for CWE Trainers" to help trainers and supervisors train students more effectively. These are based on the comments made by students and trainers during the study.

Effective Training Techniques for CWE Trainers

CWE students are assigned to work sites to learn to be good employees and technicians. They are there to learn and practice technical skills necessary to perform well, to learn how to interact and communicate effectively on the job, and to learn about the industry and being a professional technician. Students should ask lots of questions about all of these topics. They should be respectful of your knowledge, skills, abilities, and time. Here are some suggestions for helping CWE students learn from their experiences.

1. Work together on projects and explain your thought processes as you go, i.e. say what you're thinking as you work through a problem. This enables students to immediately compare what you say with their own thinking and ask questions for clarification.
2. Give clear and complete instructions and expected results. Check to be sure students understand the instructions. Students want to do well, but may not have enough confidence in their skills and abilities to know what they can or cannot do. They also do not want to make mistakes.

Clear instructions help students know where and how to begin and to avoid mistakes.

3. Ask questions of the students—How? Why? and What if? Ask them to explain and describe what is going on. Ask them why something happened the way it did or the reason for doing a process a certain way. In a problem-solving situation, ask them to describe, ahead of time, the problem, what they think possible solutions are, and the process they would use to solve the problem. Have them write down or outline the steps and the reasons for each step or draw a diagram so that, when the problem is solved, they can compare what actually happened with what they thought would happen. (Homework assignments are okay!)
4. Most students enjoy and learn from trying to figure things out independently. Help them by suggesting resources and providing enough information to keep them on track toward the answers or solutions.
5. At the end of a job or task, ask the student to review what happened so that you can critique the student's thought processes. "Why" and "explain" are good questions. The sooner this review can happen, the better.
6. Watch for opportunities to help students learn about other aspects of the job, the profession, and the company. Learning from a wide range of realistic situations is an important part of a CWE experience. Encourage and help students to pursue learning opportunities as they arise.

Suggest resources: people to talk to, places to go, material to read, or things to look at.

7. Help students to understand what it's like to be a professional technician in your industry and occupation. Include students in informal conversations and activities. Tell stories. Talk about work conditions and opportunities, good jobs and bad jobs, and anything else that will help students form realistic impressions of being technicians in your industry.
8. Most importantly, give students feedback frequently regarding their work (quality and quantity), work habits, attitudes, communication, and behavior. They are students and are there to learn. They need to know if they are doing or saying something wrong so they can correct it before it affects their employment status or potential. They also need to know when they are doing well. For most people, criticism is most effective when it is offered as soon as possible after an incident and given respectfully and in private.

Recommendations for Further Research

Fletcher (1989) noted early research in cooperative education was dominated by efforts to justify programs. Researchers focused on outcomes and benefits without addressing how the benefits were achieved. While numerous reports con-

firm the positive results of cooperative education, Wilson (1997) noted a dearth of explanations for these results.

By looking at the social and learning strategies students actually use during their work experiences, this present study explains how students learn during CWE through cognitive apprenticeship, solving problems, incidental learning, and practice. From interviews with students and trainers, the researcher identified and described strategies that can help students manage and maximize their learning.

The findings of this study suggest several areas for further research:

1. The relationships between students and trainers require further examination to help students better understand the connections between their attitudes and behaviors and the effectiveness of their training. The notion that trainers have a higher priority, i.e. productive work, changes the dynamics of these relationships by shifting primary responsibility for learning to students. This causes such relationships to be distinctly different from typical trainer/trainee or teacher/student relationships.
2. Similarly, the impact of student behaviors on the attitudes of trainers needs to be further examined in professional/technical and other career areas. In general, CWE programs consider work ethic an aspect of employment whereas trainers view it as an indicator of students' motivation to learn and respect for trainers. While this study noted that some trainers specifically do not like cockiness or students that breach

the hierarchical status of positions, other behavior patterns deserve further analysis.

3. The first three findings regarding responsibilities and relationships between trainers and students may apply to other educational formats. Using these findings as a premise, research is needed to determine if this information is more widely applicable.
4. Incidental learning is a key strategy for CWE students. However, work experiences contain more incidental learning opportunities than students could possibly pursue. Consequently, eager students could spend too much time on insignificant or unimportant opportunities. Further study is needed to determine criteria students could use to select appropriate incidental learning opportunities.
5. This study introduced a problem-solving model that includes personal, organizational, and occupational values as having a determinant role in selecting possible actions and evaluating the results of the actions. The impact of values on solving problems in vocational situations deserves further examination.
6. While this study focused on male students in traditionally male programs, further research is needed with other demographic groups and occupational areas. For example, women in traditionally female programs, males in traditionally female programs, etc. deserve study. Studies using other categories such as ethnic origin, previous work

experience, and age could add important information for CWE students, trainers and advisors, as well.

Summary

This study identified several social and learning strategies that students use to maximize learning from cooperative work experiences.

1. A candid and respectful relationship between student and trainer must exist before the trainer will share fully his expertise and knowledge with the student. The student has primary responsibility for establishing and maintaining this relationship.
2. The effort a trainer is willing to expend on training reflects his perception of a student's eagerness to excel and willingness to work hard.
3. Students have primary responsibility for managing their own learning during work experiences.
4. Students should use four learning strategies to maximize their learning from cooperative work experience:
 - a. Apply cognitive apprenticeship processes
 - b. Solve problems
 - c. Recognize and pursue incidental learning opportunities
 - d. Practice technical skills

Other significant aspects of this study included identifying the unique characteristics of the CWE trainer/trainee relationships and the impact these have on

students' responsibility for learning; incorporating personal, organizational, and occupational values into problem-solving; and identifying and listing effective training techniques for trainers.

Understanding the information in the findings is important for students preparing for work experiences. The comments by worksite trainers in Chapter 4 provide valuable insights for students regarding trainers' perspectives of student behaviors and attitudes. The Effective Training Techniques listed above may help trainers develop better teaching skills and improve their effectiveness as trainers. For CWE advisors and instructors, the findings of this research can serve as curriculum guidelines for preparing students to maximize their learning during work experiences.

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APPENDICES

APPENDIX A

INFORMED CONSENT DOCUMENT

You have volunteered to participate in a research study about self-management strategies that community college students need to take maximum advantage of the learning opportunities of a CWE experience. This includes strategies used by students in establishing effective working relationships with trainers and in managing their own learning. With this information the college can better prepare students for work experiences and employment.

For this study, I am interviewing both trainers and students regarding attitudes, behaviors, and learning strategies that create an effective teaching and learning environment. The interviews take 30-45 minutes. The questions for trainers focus on expectations of students. The questions for students focus on how they work and learn. I will tape record the interviews for later reference. After I have completed the interviews with students I will convene focus groups of the participants (2-5) to review and verify the accuracy my collective observations. During this discussion I will not make connections between any specific behaviors and an individual.

As a result of participating in this study, students may gain a greater awareness of their own learning strategies and become more effective learners. The interviews and focus group may help students to improve the ways they learn. I do not foresee any risk for the participants.

The final report will not contain any personally identifiable information about you. Your participation and the comments you provide will be held in strict confidence. Your name and the name of the organizations where you worked will not be revealed. I will maintain the records of this study in my personal files for three years. If you have further questions about this research project or concerns, please contact either Dr. Betty Duvall at Oregon State University, (541) 737-5197, or Ted Risser, student investigator at (541) 471-7477. If you have questions about your rights as a human subject, please contact the Institutional Review Board Coordinator, Oregon State University, (541) 737-8008.

Your participation in this study is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you would otherwise be entitled. You may discontinue participation at any time.

I appreciate your willingness to participate in this study. I believe that you will find it interesting and beneficial. If you have any questions or concerns, please contact me at (541) 471-7477 or your CWE advisor.

 Name of trainer

 Signature

 Date

 Signature of researcher

 Date

APPENDIX B**QUESTIONS FOR CWE STUDENTS**

Name _____ Business _____
 Phone _____ Date _____
 Prior work experience _____

1. Do you consider your CWE successful? Why?
2. Was it what you expected?
3. Has your enthusiasm for this occupation increased/decreased as a result of the CWE?
4. How did you learn appropriate behaviors, dress codes, etc.?
5. What advice would you give to the next student coming to this work site/group?
6. How were you (most commonly) "trained"? (Worked with a trainer or trainers as a co-worker, as an apprentice, assigned tasks and worked independently, etc.)
7. Who did you use as a role model(s) for work habits and acceptable behaviors? (May be more than one) Why did you select this person(s)?
8. Did a previous work experience help you adjust to this work setting? How?
9. Were there behaviors and attitudes from that experience that you had to "unlearn"?
10. Can you describe the values and goals for the business?
11. What is the organizational structure of the company?
12. Is this a place you'd like to work? Why?
13. What social skills are important for a successful CWE? Rate these from most to least important.
14. Were other employees supportive of you and what you were doing?

15. How do you believe you learned most effectively during the CWE?
16. Did you feel “accepted” by your trainer and other employees? What indicators/incidents is that based on? Did you make any special efforts to be accepted?
17. Did you receive any feedback regarding your behavior, attitude, and work habits and performance? How?
18. Did you learn “the hard way” about any behaviors?
19. What unexpected or surprising things did you learn about the people you worked with?
20. What social skills are necessary to be successful in the organization?
21. Are there specific work habits, personal behaviors, or attitudes that are especially important to the people you work with? Did you adjust/change your work habits, attitudes, or behaviors when you began your CWE? Why?
22. Did you observe behaviors or attitudes that you felt were inappropriate? What were they? Were there ethical issues involved?
23. Did you ask lots of questions? Of who?
24. Did you ask all or most questions of one person or did you ask different people about different topics?
25. Who gave you the most credible answers?
26. Did you have questions that went unanswered? What were they and who should have answered them?
27. Would you rate yourself as reserved or out-going? Reserved 1 2 3 4 5
Out-going
28. Do you feel you had a positive attitude toward your CWE and the people you worked with? Positive 1 2 3 4 5 Negative
29. Do you consider yourself as self-confident? No 1 2 3 4 5 Very
30. Did the CWE orientation and preparation by your college advisor include all the information it should? What else should be included?

31. What other information or skills should be added to the program curriculum?
32. What do you wish you had known before you began the CWE? Were there specific skills or knowledge that would have helped you learn more?
33. If you had an orientation at the company, who did it? Did it include all the information it should? Did it make you feel welcome?
34. If you had the opportunity to talk to new CWE students, what advice would you give them about making the most of the CWE experience?
35. Looking back, would you have done anything differently to prepare for, or during, your CWE?

APPENDIX C**QUESTIONS FOR TRAINERS**

Trainer _____ Business _____

Date _____

1. Did the student seem eager and willing to learn? How did you know?
2. Did the student make an effort to learn about and get along with the people he/she worked with? Was there anything that stands out as a noteworthy effort?
3. Did the student take opportunities to work with and talk with other employees about their jobs, the business, and its goals and values? Frequently?
4. Would you describe the student as self-confident or reserved? Did he speak up?
5. Did the student communicate effectively with you, other employees, and customers? Can you give an example?
6. Did the student talk about or reflect on what they learned?
7. Were there any disagreements? How did the student handle them?
8. Did the student do anything unusual or different to learn about this business?
9. Was the student curious? Did the student pursue his or her curiosity? How did the student go about it?
10. Was the student's curiosity about the work and/or about other people and their roles, the business, management, other functions, etc.?
11. Could you tell that the student was learning? How do you know?
12. Did the student do those things that you indicated earlier on the questionnaire as important? Which need improvement?
13. Did the student have any irritating habits?
14. What did the student do well?

15. Considering all the students you have trained, what general advice do you have for students about how they could get more from a CWE?
16. What advice do you have for students before they go to work?
17. Are there specific behaviors or attitudes the student should change?

APPENDIX D

SUMMARY OF QUESTIONNAIRE FOR TRAINERS

Trainers rated the following items in order of importance for CWE students to demonstrate. This is the compilation of 12 trainers using a scale of 1 to 5 with 5 being the most important. The maximum possible score is 60.

1. (59) Ask questions for clarification.
2. (58) Be on time and mentally and emotionally ready to work.
3. (58) Pay attention to instructions and advice.
4. (57) Have a positive attitude toward training and the work to be done.
5. (57) Know safety practices and watch for unsafe situations.
6. (56) Behave appropriately for the work setting.
7. (56) Accept responsibility for assigned tasks.
8. (56) Be respectful of other employees and customers.
9. (55) Show initiative. Look for obvious things to be done.
10. (55) Be cooperative and participate in group work/activities.
11. (55) Let the trainer know if you will not be there as scheduled.
12. (54) Let the trainer know when you have completed an assignment.
13. (53) Check with the trainer before trying a different or new procedure.
14. (51) Be dressed and groomed appropriately.
15. (51) Ask for feedback regarding performance.
16. (50) Ask questions about procedures and reasons for them.
17. (46) Talk about and review what they have learned.
18. (46) Ask for clarification and explanation about comments made by other employees.

APPENDIX E

SUMMARY OF INTERVIEWS WITH TRAINERS

The following are observations from interviews with trainers. This information was provided to CWE advisors prior to the focus group meeting. Because of the unstructured nature of the interviews, I did not ask the same questions of every interviewee. I did, however, cover common topics. These observations are generally arranged in descending order according to my impressions from the interviewees.

The attitudes they expect students to have:

Show a keen interest in the job and learning.

Be eager to learn—be early, stay late.

Be curious, ask questions.

Have a positive attitude about being there.

Be motivated to do a good job and excel.

Be ready and willing to work hard.

Have patience; you're not going to the top job immediately.

Admit you don't know.

Mistakes are okay but learn from them.

Initial impressions are important.

Assess the work setting; be a little cautious until you understand what's going on.

Don't hesitate to jump in.

Respect the trainer for what he knows and the work that he does.

Understand the hierarchy of jobs in an organization.

Cockiness is the wrong attitude.

Preferred work habits:

Generally, have a good ethic.

Be reliable; be on time.

Listen and do as you're told.

Pay attention to details.

Work hard.

Be a team player and be aware of your impact on other employees and their effectiveness.

Be able to work independently and responsibly.

Ask before you try something.

Show up appropriately dressed and ready to work.

Work until the job is done.

Ask for feedback on performance.

Make a productive contribution.

Don't get angry.

Respect and relate to customers; watch your language.

Trainers believe students learn through:

Observing.

Listening.

Reading.

Doing tasks with help.

Solving problems.

Mentally anticipating (asking the student questions as part of problem solving).

Asking questions.

Exposure to a broad range of situations and problems.

To learn, trainers believe students should:

Take the initiative to learn at every opportunity. (That doesn't mean leaving at exactly 4 p.m. everyday.)

Ask questions—lots of questions.

Pay attention to the surroundings, more than just the task assigned.

Take opportunities to broaden exposure to and knowledge about other activities.

Solve problems.

If frustrated by a problem, take a time-out to think.

Problems with the CWE program and student preparation:

Lack of basic skills, especially reading.

Lack of a good work ethic.

Training on obsolete or wrong equipment or skills.

Inappropriate learning plans—too specific.

Poor interviewing and first impression skills.

Flat rate shops and competition for work.

Bottom line impressions:

1. Trainers are not compensated to be trainers; training is not their primary job or responsibility. Their first priority is to get the job done. In general, their attitude toward the student and the effort they are willing to expend in training will reflect the attitude, efforts, and interest level of the student.
2. The effectiveness of the relationship with the trainer is the student's problem. There is work to be done; students can take it or leave it.
3. Most are not trained as trainers. The primary responsibility for learning is the student's.
4. Students should ask lots of questions. Students have immediate access to the trainer; they should use it.
5. Trainers expect students to be opportunistic learners and take advantage of learning opportunities. That means paying attention to everything that goes on around them and being willing to work when the opportunity is there.
6. Trainers are selected because they are good employees who work hard; they expect the same from students. That includes a drive to excel and be the best mechanic/technician possible and willingness to work hard.

7. Trainers expect to be respected for their knowledge, skills, and abilities. Most want to do a good job training a student.
8. Trainers expect students to make a productive contribution and to understand that they are establishing a reputation as a mechanic/technician that can impact their ability to get a job.

APPENDIX F

SUMMARY OF INTERVIEWS WITH STUDENTS

CWE advisors received this summary of interviews with students prior to the focus group. At the time of the interviews, some of the students were still enrolled in CWE, others had completed. Almost all were being compensated for their work.

Elements students said made a good work experience:

A realistic job situation with actual task completions.
 Exposure to a wide range of situations and problems.
 Learned the characteristics of a good working environment.
 Learned the nature of the work environment for that career.
 Work expectations.
 Physical expectations.
 Enabled them to prepare for a future job (specialization).
 Strengthened their opinions about a career and possible progression.
 Enabled them to acquire expertise and to practice and use skills learned in school and on the job.
 Provided opportunity to develop a personal reputation.
 Ready and convenient access to trainer as a source of information.
 Feeling supported.
 Being accepted by the work group.

Attitudes and behaviors students believe are important to a successful experience:

Patience with the job situation and rate of training.
 Enjoy the work and learning.
 A generally positive attitude toward work and the work situation.
 Pride in quality.
 Motivation to learn and the initiative to take advantage of learning opportunities.
 Willingness to take on tasks.
 Realistic self-assessment and confidence in known abilities.
 Recognizing their responsibility for learning.
 Respect for trainer's knowledge and abilities.
 Being able to recognize and make adjustments to personal behaviors and attitudes to adapt to the work environment.
 Recognize that there may be socialization rituals and processes that are part of gaining acceptance.
 Don't be cocky.

Student understanding of a production environment:

Employers expect productive work.
 Students need to be able to work independently.

Employers expect high quality work that reflects organizational values and satisfies customers.

Employers expect good work ethics and habits.

Employers expect students to organize tasks, work hard, and complete jobs.

Processes students said they used to acquire knowledge and expertise:

Hands on doing the work.

Learning thru observation and listening.

Using problem solving to understand processes.

Being curious and asking lots of questions.

Taking the initiative to pursue learning opportunities.

Seeing multiple perspectives of work situations and environments.

Taking time-outs to think through problems.

Making mistakes.

Getting feedback regarding performance.

Using other sources of information such as:

Other employees

Manuals

Informal communications

Mentors

Storytelling

Bottom line impressions:

1. Students do not realize that a primary factor in the success of a work experience is their ability to establish an effective relationship with their trainer or trainers.
2. Students begin work experiences with expectations developed before they are exposed to the work situation. Depending upon their attitudes toward the work situation and the nature of the work situation, they may or may not take advantage of learning opportunities.
3. Students do recognize the opportunistic learning opportunities of a CWE. Every student cited hands on experience as important to gaining expertise. They appreciate problem-solving opportunities. However, in general, students do not seem to share the high level of dedication to excel or show the willingness to work hard and take advantage of learning opportunities that trainers expect them to.
4. The exposure to realistic work situations is an important aspect of CWE. Students derive satisfaction from being involved in productive work.
5. Students do not recognize the need to be responsible for their own learning. Most students recognize that CWE's present opportunistic learning situations but may not know how to make the most of those opportunities.