

PERCEIVED EFFECTIVENESS OF THE
TDW TECHNICAL TRAINING
SCHOOLS

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This study is concerned with the perceived effectiveness of the TDW technical training schools by the participants who attended the schools. The main objective was to determine the extent of importance the participant values 1) the quality of instruction (process), 2) the use of performance-based objectives, and 3) the use of "hands-on" practice time during a technical training session.

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CHAPTER I

INTRODUCTION

It is generally recognized that most skill acquisition occurs in private industry simply by having the employee learn the skill by doing it. In the past, companies have not relied too much on college sponsored instruction, seminars, or private vendor training for teaching skill acquisition because of time and cost factors. This trend has been changing very rapidly as companies are finding out that the informal and unstructured method of "learning by doing" can be a very costly process in terms of both time and costs (Somers, 1972).

Accepting the fact that employee development carries a price, one way or the other, private industries have been setting up their own in-company training programs and are relying more on outside training programs to not only provide basic skill acquisition training, but to broaden and refine the existing knowledge of their employee. This has been happening at an amazingly fast rate.

Statement of the Problem

Even with the surge of training and education in industry, there remains a general lack of information on actual experiences of companies conducting client-centered training and education programs, while literature on how training and education programs should be conducted for in-company training programs are becoming quite prevalent.

Purpose of the Study

The purpose of this study was to survey one company's approach to client-centered training and compare this with some of the more prevalent theories and principles presented in today's literature. It was hoped that this survey would help both students and businessmen to better understand some of the practical implications of the many theories and principles presented in today's literature, and to assist them in developing and/or evaluating other training and education programs.

Objectives

The objective of the study was to document the participant's perceived attitudes towards the effectiveness of TDW's Technical Training Schools. The review and analysis was limited to the following three areas:

1. The perceived importance of the instructor's ability to deliberately use process characteristics effectively.
2. The use of performance based objectives in training, and
3. The perceived importance of minimizing problems typically associated with providing "hands-on" practice time.

Research Questions

With the conscious effort being made from many directions (seminars, professional organizations, trade journals, etc.) to improve the effectiveness of the TDW instructor, several major questions need to be answered:

1. To what extent is having an instructor conscious of the different factors (process) that help create a comfortable learning

environment for adults perceived to be important by participants?

2. To what extent is the use of performance-based objectives perceived to be important in a training program?

3. To what extent is the training functions awareness of the problems associated with providing "hands-on" practice perceived to be important by the participants?

4. How useful has the TDW training been back on the job?

5. What specific areas need to be improved to heighten the overall degree of effectiveness in the following areas:

- a. Quality of instruction
- b. Use of performance-based objectives
- c. Use of "hands-on" practice time?

Limitations and Scope

Although a single case study, taken alone, cannot provide a basis for generalization, the case study approach can make a useful contribution to the knowledge in this field. It can also provide a basis for conducting a wider examination of industrial training practices developed for the sole purpose of skill acquisition.

Definition of Terms

The following is a list of terms as they are used in this study:

Adult learner - An adult who is enrolled in any course of study, whether special or regular, to develop new skills or qualifications, or improve existing skills and qualifications (Knowles, 1980).

Andragogy - The art and science of teaching adults and of adult learning in a climate where the adult is given primary consideration;

contrasted with pedagogy (Knowles, 1980).

Client-centered training - Training that is done especially for customers; contrasted with in-company training done especially for employees.

Content - A course design that is subject matter centered.

Pedagogy - The science or profession of teaching; also, the theory or the teaching of how to teach (Knowles, 1980).

Process - A course design that is method or delivery centered.

Stoppie Plugging Machine - A T. D. Williamson, Inc. trademark name for a mechanical device used to isolate a section of pipe for relocation, expansion, or maintenance purposes.

TDW - The initials for T. D. Williamson, Inc. which are also the letters used in the company's official logo.

Technical training schools - Three schools that offer instruction and practice time to customers in the operation and maintenance of TDW equipment. The schools have the same objectives and follow the same lesson plans, but differ in pressure ranges and equipment used.

Organization of Study

Chapter I introduced the study by presenting a brief background on skill acquisition in private industry, presentation of the problem of the study, followed by the purpose and objectives. Chapter I closed with a statement of limitations and definition of terms used in the study.

Chapter II includes a review of related literature concerning the evolution and organization of the T. D. Williamson, Inc. client-centered

training program, traits of a "star" instructor and of a "falling star" instructor, the use of performance-based objectives, and common problems associated with doing "hands-on" training.

Chapter III reports the procedures used in this study, including the creation of the questionnaire survey form, selection of the samples, process of data collection, and the analysis of the data.

Chapter IV indexes the findings of the three component parts of the survey and concludes with observations. Chapter V includes a summary of the purpose of the study and research design, conclusions and implications, and recommendations for future research.

CHAPTER II

REVIEW OF LITERATURE

The historical background of TDW, Inc., and its client-centered training program will be considered in two parts. The first part deals with the evolution and organization of the client-centered training program from its origin in 1975 to present. The second part comprised of an evaluation of the training program by reviewing literature in three areas: the instructor, understanding the use of performance based objectives, and problems associated with doing "hands-on" training.

T. D. Williamson, Inc. - The Company

T. D. Williamson, Inc. is a medium size (approximately 600 employees worldwide), multinational manufacturing company whose history began more than fifty years ago when T. D. Williamson, Sr. started a company specializing in the sale of electrical equipment to the emerging oil pipeline industry. This company continued operation and growth during the 1920's and 1930's, until the present day parent company T. D. Williamson, Inc. was established during World War II.

High pressure transmission pipeline plugging was made a reality in the early 1950's with the development of the the TDW Stopple (R)

Plugging Machine. This equipment has been used extensively since then on pipelines and plant piping. The experience and technology gained from TDW's activity in the higher pressure pipeline and plant markets led to the development of low and intermediate pressure plugging equipment designed for gas distribution systems in the early 1960's.

The Evolution of TDW's Client-Centered

Training Programs

Learning by experience or "learning by doing" is a concept that has been around for years. This method of learning can be traced back to the caveman era when fathers would teach their sons how to hunt and fish for food, and mothers would teach their daughters how to cook whatever was brought back by the sons. The result was that the learning process provided the person with the basic survival skills plus what could be learned through trial and error during the process of doing these things for a lifetime (Evans and Herr, 1978).

The notion of learning by the experience of others to be the best way to develop people is still a common perception held by many in industry today. This perception has been generally held to be true in spite of the long and drawn out process it takes for both the trainee and the company, and how costly it can be.

But, industry has learned that in order to maximize the effectiveness and efficiency for learning by the experience of others, the experience needs to be presented in an organized and deliberate, not accidental, manner. Hence, the rapid increase of in-company training programs. And the heavy reliance on college-sponsored seminars, and

private vendor training programs to provide basic skill acquisition training and to refine and broaden the existing knowledge of their employees (Bryan, 1982).

In response to requests by industry for basic skill acquisition on the operation of TDW's line of equipment the client-centered training program was developed in 1975 by the Supervisor of Customer Services, a department in Marketing. Training consisted of random discussion, held in a conference room at one location and actual practice with the equipment at another. The Supervisor of Customer Services was used as the instructor for two reasons:

1. He was a content, or subject matter, expert based on his years of relevant experience; and,
2. No other person who had the subject matter knowledge had been successful in their attempts in providing client-centered training.

The initial training program lasted three days in length and there were no charges for the participant. This method for facilitating instruction on the operation and maintenance of TDW equipment continued in 1976 and 1977. However, a fee was assessed for the instruction in 1976 at a rate of \$100.00 for the low and intermediate schools, and \$150.00 for the high pressure schools. There were a total of seventeen schools offered in 1976 and 1977.

In 1978, a facility was leased and equipped for the sole purpose of meeting the numerous requests for "hands-on" training which have increased with each new year:

1975 - 3 schools

1976 - 8 schools

1977 - 9 schools

1978 - 16 schools

1979 - 29 schools

1980 - 20 schools

1981 - 25 schools

1982 - 29 schools

The current fee is \$250.00 per participant for attending any school in 1982. The schools are conducted by four full-time instructors. There is Training Director who has the assigned responsibility for the maintenance of the facility and training aids, for evaluating the existing training programs and developing and implementing new programs, and for staff development.

The Evaluation of TDW's Client-Centered Training Programs

The evaluation of TDW's client-centered training programs will be reviewed in three areas:

1. The instructor
2. The use of performance based objectives
3. Problems of doing "hands-on" practice.

The Instructor

In surveys and discussions with training and human resource development personnel, several traits and qualifications of top trainers were itemized (Scannel, 1982). In identifying those traits most liked by business and professional participants of training programs, the

following items characterized the "star" instructor:

1. The ability to communicate
2. Knows subject matter thoroughly.
3. Shows keen interest in class.
4. Enthusiasm.
5. Understands and uses experiences of trainee.
6. Willing to help the individual participant.
7. Has a sense of humor.
8. Is sincere.
9. Endeavors to make work practical.
10. Is flexible and adaptable in the classroom.

Conversely, the surveys also indicated traits found to be disliked by participants in training programs. The "falling star" instructor:

1. Shows attitude of superiority.
2. Lacks knowledge of subject matter.
3. Does not teach clearly.
4. Is indifferent towards the class.
5. Is indifferent towards the work.
6. Is impatient with the group.
7. Uses juvenile teaching methods.
8. Does not involve the group.

How then does one teach non-instructors to instruct, teach poor instructors to instruct better, or to instruct adults? Formal instructor training, or staff development, becomes a necessity for the good instructor who wants to become a better instructor and to enable the better instructor to become a master instructor.

Memorable teachers who have influenced individuals did not do so by teaching subject matter; the individuals learned the subject matter themselves. Rather, the master teacher, or instructor, provided the incentive to learn and stimulated an unending curiosity about the subject matter. Rogers has been credited with saying "It is impossible to teach anyone anything; rather, what the teacher can do is set up the conditions in which a student can learn" (Luke, 1971, p. 12).

There are differences between the adult student and the younger student. The adult student is more "now" oriented than is the younger student. He seeks immediate application of his learning while much learning of the younger student must be deferred for later use. But, here, too, the generalizations cannot be carried too far. Many adults, particularly younger adults begin a systematic program of adult education to gradually upgrade them in their job or retrain them for an eventual new position. At the other end of the age scale, the adult anticipating retirement is frequently counseled to begin acquiring second career skills, or to develop a wider range of advocational and recreational interest well in advancement of actual retirement. The adult brings into the classroom a far greater range of first-hand experience than does the younger student. He may have more extensive knowledge in the subject matter than does the instructor, and may possess skills the instructor does not possess. The adult student may not have any better study habits, possess a longer attention span, be more tolerant of ambiguity, or have a more or less need for ego reinforcement from his peers (Knowles, 1980).

The differences in age, experience, and motivation that exists between the adult learner and the younger student points more to differences in emphasis, intensity, and utilization of teaching

methodologies than to a radically different methodology, or to a completely different educational philosophy. In so far as content is concerned, the issue of "relevancy" must be a matter of concern to all instructors who teach adults.

In short, the master instructors present a mature and integrated personality; secure and self-confident and as ready and able to learn about themselves and make changes in their own behaviors as they are to teach others. They read new materials to feed their enthusiasm for learning and living and they seldom talk about their own awards and achievements because the living example they present is a more eloquent testimonial to their own growth.

The master instructor has a sincere appreciation of the individual, a realization of the total needs the student brings to the classroom, and an awareness of the total personality and emotional impact of a room full of students. The master instructor may be capable of great showmanship -- yet not be a grandstander; he is objective without being cold and withdrawn. They are not rigid people, but have rigid standards of quality; they are skillful in diagnosing and analyzing the world about them. They are, in brief, "people centered", as well as "subject matter" centered. The master instructor is skilled in the human relations aspects of teaching and learning, and knowledgeable about why people learn, as well as how they learn. The master instructor is "trained" to this role (Luke, 1971).

Understanding the Use of Performance- Based Objectives

How much skill proficiency can be taught to twelve students in

three days? Adult students come to school sometimes having a wide variation in their ages, their motivation for learning, the depth and breadth of past experiences, and in their formal education (Snyder, 1971).

There has been a lot of material written by many different people who have differing opinions about what should be achieved by learners, and much of the material has been written for a specific clientele, which, when working with adults, defies most categorization (Knowles, 1980). What is an instructor to do then? The selection of objectives for adult learning activities requires a screening process at least partially demanded by how much time is available, and by the special wants and needs of the group to be served.

Why Even Have Objectives?

Objectives are but one part of the total instructional design process in a training program. Only when they contribute to their part in design process of the training program do they have meaning (Dick, 1978).

There has been some research questioning if it makes any difference whether objectives are used or not as part of the complete instructional design process. In most cases, this question was posed in an instructional setting with one group of students receiving a sequence of instruction preceded by objectives, and the other group receiving the sequence of instruction without being preceded by an objective. The results have been ambiguous. Some of the studies have shown significant differences in learning for the students who receive the objectives, while other studies indicated little or no difference.

Regardless of the research, there are distinct advantages for having objectives as part of the instructional design, as opposed to not having them. Objectives can serve as the basis for developing testing instruments to gauge the effectiveness of instruction. Did the teacher teach? And did the learner learn? The desired state of the teacher and the student can be a demonstrated performance from a meaningful objective. Objectives will clearly convey what is being taught to the student as well as to parents, employers, and administrators, rather than state more course goals which may sound interesting and challenging, but seldom indicate what it is the student will know or be able to do when the course is completed (Mager, 1975). An example of such an objective written in the psychomotor domain of learning illustrates this point. Psychomotor domains of learning typically involves mental and hand coordination which is the major purpose of having "hands-on" practice.

Given a Briggs and Stratton, nine horsepower, four-cycle gasoline engine that contains three different kinds of malfunctions, and given a standard set of tools, the learner must be able to repair two of the three malfunctions within one hour.

To ensure objectives will be clear in their meaning, there are five characteristics of a well written, meaningful objective:

1. Who is to perform the desired behavior (e.g., "the student" or "the learner")?
2. The actual behavior to be employed in demonstrating mastery of the objective (e.g., "to write", "to speak", "to repair", "to explain", "to use").
3. The result (e.g., the product or performance) of the behavior,

which will be evaluated to determine whether the objective is mastered (e.g., "an essay", "a speech").

4. The relevant conditions under which the behavior is to be performed (e.g., "in one hour", "without notes").

5. The standard that will be used to evaluate the success of the product or performance (e.g., "90 percent right", "four out of five right").

Other advantages in having written objectives are: They facilitate the development of pre-tests and post-tests; improve the confidence of the learners in their subject matter; and reduce student anxiety. But, simply having objectives will not lead to better lesson plans nor improve the other components of an instructional design.

Objectives do not describe the textbook to be used nor what an instructor will be doing during the course. Objectives have names. Mager first used the term "behavioral" objectives in the early 1960's as a statement that describes what a student will be able to do with the instructional intent communicated to him to the degree that it describes or defines the terminal behavior expected of the student. Terms such as performance, educational, or instructional objectives have been used in place of behavioral objectives, but their meanings are synonymous with that of behavioral objectives (Mager, 1975).

Early in the design of an instructional program, goal(s) are set. The goal, or goals, are statements that describe what it is that students will be able to do after they complete the instruction. When instructional goals are converted to objectives, they become referred to as terminal objectives which are objectives that describe exactly what the student will be able to do when he or she completes a unit of

instruction. Through the process of satisfying the criteria set forth in the terminal objective, shorter objectives are used to help pave the way to the completion of the terminal objective. These objectives are referred to as subordinate or enabling objectives. They direct the proper completion and sequencing of the various subskills needed to reach the higher objective.

Private industry is not in the business of educating its people just for the sake of education, but is in the business of educating them to do specific tasks on the job. Objectives should always receive careful consideration by the trainer when developing that part of the curriculum for the particular training program to ensure the time and money are well spent.

Problems of Doing "Hands-On" Practice

In Client-Centered Training

Most people who are responsible for the design, implementation, and evaluation of technical training have widely accepted and adopted the general principle that "hands-on" (practice) training is better than non-"hands-on" training particularly in areas where the student is required to demonstrate a performance according to a predetermined objective (Mallory, 1981). While the principle is generally held to be true, the results obtained by those who provide "hands-on" training vary tremendously.

There are six areas that usually account for variability of results in "hands-on" sessions:

1. Excessive peer pressure
2. Insufficient access to practice devices

3. Inadequate presentation
4. Unstructured practice
5. Deficient performance feedback
6. Inappropriate task or task environment simulation.

Peer Pressure in technical training is evidenced by the slow learner who may be put on the spot to perform in a practice session. In fact, the slow learner may feel an element of fear by the possibility of ridicule. It is absolutely essential that the pressure to perform perfectly be removed from the practice environment if the practice session is to be effective.

Insufficient access to practice devices will cause variability of results in "hands-on" sessions. This situation is usually caused by too many students, too little time, or by a lack of equipment. In fixed scheduled training programs, too often the lecture theory portion of the class will digress into discussions of the instructors and the students. Multitude of related, and some not so related, past experiences. The result is the practice sessions have to be shortened, or eliminated, in order for the class to finish on time. In many practice sessions, too, there is a tendency for the instructor to turn the practice session into an instructor performed demonstration. Thus, not allowing the students to get sufficient practice time.

Another point is that instructors sometimes give themselves a break from the routine by allowing the more dominant personalities to monopolize the practice session. Lastly, there simply is no substitution for practicing on the actual equipment. Simulation equipment, such as video playback systems can only take the student as far as the theory is concerned, but does nothing to acquaint the student with an actual

feel for the equipment.

Inadequate presentations probably represents the largest discrepancy in technical training because they can lead the student to the practice session with an incomplete knowledge of the task to be practiced. Inadequate presentations describe how equipment and systems work in their own jargon, or technical terms. They will tell the student what the equipment looks like, how much it weighs, what its capabilities are, and even cost information. After being told of this information, the students are then expected to adjourn to the practice area and begin turning knobs and sometimes even problem shooting. Trouble shooting practice is only an illusion at best, because the equipment is too expensive to be caused to fail on purpose, or to chance the student breaking it. Students need to be provided a cognitive framework of facts describing the task steps, step order and indications of successful task step completion.

Unstructured practice: The purpose of the practice sessions, in most technical or skills training programs, is to provide the student with the opportunity to practice a new task. Often, the skill or ability acquisition is described as "getting the feel" of the equipment.

Ability acquisition or "getting the feel" of the equipment is usually effective in situations where the student already possesses a prior experience (i.e., gaining familiarity with a new model automobile) with the equipment. It is less effective in situations that provide the student with gradual or even no immediate feedback. In these situations, task proficiency is built only through extended practice and exposure that can, in some cases, take years to master (i.e., a

student learning how to disassemble and trouble shoot combustion engines would not be expected to begin disassembly after learning basic operating principles on the first day).

Deficient performance feedback: If the student does not receive feedback from the results of the practice session, then the practice is meaningless. Feedback, even in the broadest terms, can provide the student with such information as accuracy and speed in following the appropriate procedural steps. It is difficult, if not impossible, for a student to improve performance without the feedback.

Inappropriate simulation: A common problem in technical training situations is that oftentimes the tasks practiced in training are not performed on the job. Course content should be decided first before the practice sessions are designed in order to guard against providing information to the student which will allow him to become familiar with only the training devices rather than the overall job task.

Summary

This chapter reviewed the evolution and organization of TDW's client-centered training programs. Beginning in 1975 with three schools and one instructor, the school has grown to twenty-nine schools and four instructors. Chapter II also reviewed traits and qualifications of top trainers and noted the less desirable traits found in trainers as well. It was discussed in this chapter how the characteristics of the adult learner differ from the younger students and the use of performance based objectives was discussed including a discussion why have objectives in the first place. The chapter concluded with a review of the problems generally associated with providing "hands-on" practice time for the participants.

CHAPTER III

METHODOLOGY

In this chapter, the methodology of the study is reported.

Included in the discussion are: 1) the development of the questionnaire survey form, 2) selection of the sample, 3) the process of data selection, and 4) the analysis of data.

Development of the Questionnaire

Survey Form

In order to accomplish the objectives of this thesis, data were gathered from past participants of the TDW client-centered training program. The instrument used to collect the data from the respondents was a questionnaire survey form. (See Appendix A for a copy of the questionnaire survey form.) The self-administered questionnaire, mailed to each participant in the sample, was composed of 22 questions, of which six related directly to the instructor; five related to the use of performance-based objectives; six related to "hands-on" practice; three related to demographic data; one related to the usefulness the training has been since the participant has been back on the job; and Number 22 was simply space provided for additional comments. A five-point Likert scale was used with each response given a value ranging from one (very great extent) to five (very little extent). The self-administered questionnaire was pre-tested and estimated to require

fifteen minutes to complete. The survey form was accompanied by a cover letter. (See Appendix B for a copy of the letter.) The purpose of the cover letter was to: 1) introduce the self-administered questionnaire, 2) inform the recipient of the identity of the researcher, 3) explain the purpose of the study, and 4) make the recipient understand that the survey is important and worthwhile. The recipients were asked to complete the questionnaire and return it in a self-addressed, postage-paid envelope.

Selection of the Sample

The respondents were selected from the total number of students who have attended a technical training school from the schools' beginning in 1975 to May, 1982. The total number of these potential respondents was 1,647. All foreign participants with the exception of those persons from Canada were omitted. The reason for the omission of foreign participants was due to the anticipated delay in turnaround time of the mail, and because the majority of these students have English as a Second Language (ESL). It was believed the ESL's would have a problem understanding the purpose of the survey as well as the instructions to complete the survey form.

The omission of the foreign participants reduced the total of potential respondents to 1,335. The desired sample size was 200 respondents (15 percent). With the desired size of 200, every sixth element in the population was sampled beginning with a random start with an element from one to six. The initial number was determined from a table of random numbers.

Process of Data Collection

The questionnaire survey form and cover letter was mailed to 200 past participants on July 27, 1982. The time frame for the sampling was July 27 to August 15, 1982. Of the 200 survey forms mailed, there was a total of 134 useable survey forms returned -- a return rate to 67 percent. There were also six envelopes returned as undeliverable. Because of the good percentage of return, there was no effort to contact any respondent by telephone, or to do a second mailout.

Analysis of Data

Each question was tabulated by a mini-computer. The percentage of responses were summed across the five factors on each question to assign each a percentage score, and by totaling each column to create a satisfaction index for each component part of the survey. Cross-tabulations were made for the purpose of comparison by: 1) the different age groups, 2) the different number of years of experience with the equipment, and 3) by the difference in responses of white collar verses blue collar respondents. (Appendix C contains overall response totals.)

CHAPTER IV

RESEARCH FINDINGS

The objective of this chapter is to present the findings of this study. The chapter is organized as follows: (1) response rate, (2) demographic information, and (3) analysis and discussion of findings.

Response Rate

A total of 200 questionnaire surveys were distributed through the mail to randomly selected, past participants of TDW's hot tapping and plugging schools. Eligibility for a participant to be selected as a respondent was limited to the United States and Canada participants only. One-hundred thirty-four questionnaires were returned representing a 67 percent response rate.

Demographic Information

Since the primary focus of this study was to determine the participants' perceived attitudes towards the effectiveness of TDW's technical training schools, selected demographic characteristics were requested to assess their bearing on the overall findings of this study. Respondents were asked to indicate age, years of related work experience with TDW equipment, and job positions.

The majority of the participants were between the ages of 25 and

55 years. There were four respondents under 25 years representing three percent of the total, and 11 respondents who were over 55 years representing 8.2 percent of the total.

The range in experience was almost equal among the groups. There were 33 respondents, or 24.6 percent who had under two years experience. The 2-5 years experienced group had 36 or 26.9 percent of the respondents. The 5-10 years experienced group represented the low with 25 respondents, or 18.7 percent of the total. The over-10 years experienced group had the high with 37 respondents or 27.6 percent of the total.

The most revealing demographic information was the breakdown by job position. The white collar workers were clearly the majority in attendance with 80 respondents or 59.7 percent. The blue collar worker had 46 respondents or 34.3 percent.

There were also some respondents who did not choose to answer one or more of the questions pertaining to demographic information. The age and years of experience groups had three respondents each, or 2.2 percent who did not answer the question regarding age or their number of years of experience with TDW equipment. There were eight respondents who did not indicate their job position which represented six percent of the total. Table I summarizes the respondents demographic data.

Analysis and Discussion of the Findings

The ratings of the different survey parts, i.e., quality of instruction, use of performance-based objectives, and problems associated with doing "hands-on" practice were valued on a five-point Likert scale. The scale ranged from (1) to a very great extent, to

TABLE I
FREQUENCIES AND PERCENTAGES OF RESPONDENTS
CLASSIFIED BY DEMOGRAPHIC
CHARACTERISTICS

Characteristics	Frequency*	Percent
Age (years)		
Under 25	4	3%
25-35	38	28.4%
35-45	43	32.1%
45-55	35	26.1%
Over 55	11	8.2%
Unspecific	3	2.2%
Total	134	100%
Years experience with TDW equipment:		
Under 2	33	24.6%
2-5	36	26.9%
5-10	25	18.7%
Over 10	37	27.6%
Unspecific	3	2.2%
Total	134	100%
Job position**		
White collar	80	59.7%
Blue collar	46	34.3%
Unspecific	8	6%
Total	134	100%

*Some respondents chose not to answer every question.

**Job positions listed by the respondents of this survey were:

White collar: Supervisor, Superintendent, Foreman, and Engineer

Blue collar: Operator, Welder, Technician, Helper, and Driver.

(5) to a very little extent. The respondents selected from this range the rating of importance he/she felt each question contributed toward an overall effective training program.

Each column was totaled across, then summed to obtain a combined response total for each part of the survey. Then the columns were totaled separately to create an overall satisfaction index by range of responses to each question. This was computed for each part of the survey. A comparative analysis was then made using the same methods to obtain data by the following areas:

1. Results tabulated by the different age groups;
2. Results tabulated by the different years of experience with TDW equipment;
3. Results tabulated by the different job positions.

Quality of Instruction

Part I of the questionnaire survey form dealt with the quality of instruction and asked the following questions:

1. To what extent should the instructor understand and use the experiences of the class?
2. To what extent should the instructor show a willingness to help the individual participant?
3. To what extent should the instructor create an informal learning environment?
4. To what extent should the instructor show a sense of humor?
5. To what extent should the instructor involve the group?
6. To what extent should the instructor be flexible and adaptable in the classroom to satisfy the objectives of the participants?

The response range for each question was (1) very great extent, (2) great extent, (3) moderate extent, (4) little extent, and (5) very little extent. The response from Questions 1-6 were then combined to provide an overall satisfaction index average to questions concerning the quality of instruction. The combined responses are presented in Table II. Responses to each individual question are contained in Appendix B.

Of the 803 combined individual responses to the six questions related to quality of instruction the largest number, 355 or 44.2 percent, were satisfied to a "great extent". In all, 64 percent or 514 felt satisfied to a "very great" or "great extent". Only 2.8 percent or 23 responses were not satisfied (to a "little" or "very little extent").

The breakdown of the satisfaction index by age is presented in Table III. Participants under 25 years (15) were satisfied largely to a "very great" or "great extent". This is indicated by 62.5 percent of the total responses. The remaining 37.5 percent indicated satisfaction to a "moderate extent". There were no responses by the under-25 years age group who indicated a lack of satisfaction.

The 25-35 years age group were satisfied largely to a "very great extent" or "great extent". This is indicated by a combined percentage of 67.5. There were 69 responses or 30.3 percent which indicated satisfaction to a "moderate extent". Five responses or 2.2 percent, showed a lack of satisfaction by indicating "little extent" to some of the questions concerning satisfaction with the quality of instruction by age.

The 35-45 years age group indicated satisfaction by either "very great extent" or "great extent" with 66.1 percent of the total responses.

TABLE II
RESPONSES TO QUESTIONS CONCERNING
SATISFACTION WITH QUALITY
OF INSTRUCTION

	Satisfaction Index					Total
	Very great extent % (N)	Great extent % (N)	Moderate extent % (N)	Little extent % (N)	Very little extent % (N)	
Overall Responses	19.8 (159)	44.2 (266)	33.1 (266)	2.1 (17)	.7 (6)	100* (803)

*The 100 percent figures may be slightly higher or lower due to rounding.

TABLE III

OVERALL RESPONSES TO QUESTIONS CONCERNING
SATISFACTION WITH QUALITY OF
INSTRUCTION BY AGE

Age		Satisfaction Index											
		Very Great extent		Great extent		Moderate extent		Little extent		Very little extent		Total	
		%	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%*	(N)
Under	25	16.7	(4)	45.8	(11)	37.5	(9)	0		0		100	(24)
	25-35	21.9	(50)	45.6	(104)	30.3	(69)	2.2	(5)	0		100	(24)
	35-45	27.2	(70)	38.9	(100)	30.0	(77)	2.3	(6)	1.6	(4)	100	(228)
	45-55	11.4	(24)	46.7	(98)	39.5	(83)	1.9	(4)	.5	(1)	100	(257)
	Over 55	10.6	(7)	54.5	(36)	30.3	(20)	3.0	(2)	1.5	(1)	100	(66)
	Unspecific	22.2	(4)	33.3	(6)	44.4	(8)	0		0		100	(18)
	Overall	18.3	(159)	44.1	(335)	35.3	(266)	1.6	(17)	.6	(6)	100	(803)

*The 100 percent figures may be slightly higher or lower due to rounding.

There were 77 responses or 30.0 percent who indicated satisfaction to a "moderate extent". The 35-45 years group had six responses, or 2.3 percent who were not satisfied.

The 45-55 years group indicated satisfaction to either a "very great extent" or "great extent" by 58.1 percent of the total responses, while 83 or 39.5 percent indicated satisfaction to a "moderate extent". There were five responses or 2.4 percent that were not satisfied (to a "little extent" or "very little extent").

The over 55 years group were largely satisfied to a "very great extent" or "great extent". This is indicated by a combined percentage of 65.1. There were 20 responses or 30.3 percent, which indicated satisfaction to a "moderate extent". Three responses or 4.5 percent indicated a lack of satisfaction (to a "little extent" or "very little extent").

There were a total of 18 non-responses to the questions concerning satisfaction with the quality of instruction by age.

The breakdown of satisfaction index by years of experience is presented in Table IV. Participants having 0-2 years of experience indicated satisfaction to either a "very great extent" or "great extent" with 129 or 62.5 percent of the total responses. There were 67 or 33.8 percent who were satisfied to a "moderate extent" and only two or one percent who indicated they were not satisfied (to a "little extent" or "very little extent"). The 2-5 years experienced group indicated satisfaction by a combined response rate of 131 or 60.9 percent who were satisfied by either a "great extent" or "very great extent". There were 20 or 32.6 percent that were satisfied to a "moderate extent", but there were 14 or 6.5 percent that were not

TABLE IV
OVERALL RESPONSES TO QUESTIONS CONCERNING
SATISFACTION WITH QUALITY OF
INSTRUCTION BY YEARS
OF INSTRUCTION

Years	Satisfaction Index						Total %* (N)	
	Very Great extent % (N)	Great extent % (N)	Moderate extent % (N)	Little extent % (N)	Very little extent % (N)			
0-2	19.2 (38)	46.0 (91)	33.8 (67)	1.0 (2)	0		100	(198)
2-5	21.4 (46)	39.5 (85)	32.6 (70)	4.2 (9)	2.3 (5)		100	(215)
5-10	22.7 (34)	39.3 (59)	34.7 (52)	2.7 (4)	.7 (1)		100	(150)
Over 10	16.7 (37)	51.4 (114)	31.1 (69)	.9 (2)	0		100	(222)
Unspecified	22.2 (4)	33.3 (6)	44.4 (8)					
Overall	20.4 (159)	41.19 (355)	35.3 (266)	1.8 (17)	.6 (16)		100	(803)

*The 100 percent figures may be slightly higher or lower due to rounding.

satisfied which is the highest unsatisfied rating noted. The 5-10 years experienced group had a combined rating of 93 or 62 percent who were satisfied to either a "great extent" or a "very great extent".

There were 69 or 31.1 percent which were satisfied to a "moderate extent", and only two or .9 percent which were not satisfied (to a "little extent" or "very little extent").

The breakdown of the satisfaction index by job positions is presented in Table V. The blue collar participants were satisfied largely by either a "great extent" or a "very great extent" with 172 or 62.6 percent. There were only 12 responses or 4.3 percent of the blue collar responses not satisfied (to a "little extent" or "very little extent").

The white collar workers indicated a higher satisfaction rating with a combined 372 responses or 70.8 percent which felt satisfied to either a "great extent" or to a "very great extent". Only nine responses or 1.8 percent of the white collar responses were not satisfied. There were 31 non-responses to the questions concerning satisfaction with quality of instruction by job positions.

Use of Performance-based Objectives

Part II of the survey dealt with the use of performance-based objectives and asked the following five questions:

7. To what extent do you believe having course objectives is important?

8. To what extent do you feel these objectives, as stated in the beginning, were helpful in completing this course.

TABLE V
OVERALL RESPONSES TO QUESTIONS CONCERNING
SATISFACTION WITH QUALITY OF
INSTRUCTION BY JOB POSITION

Job Position	Satisfaction Index									
	Very Great		Great		Moderate		Little		Very little	
	%	(N)	%	(N)	%	(N)	%	(N)	%	(N)
Blue Collar	17.5	(48)	45.1	(124)	33.1	(91)	3.3	(9)	1.0	(3)
White Collar	21.1	(105)	49.7	(222)	32.4	(161)	1.4	(7)	.4	(2)
Unspecific	19.4	(6)	29.0	(9)	45.2	(14)	3.0	(1)	3.0	(1)
Overall	19.3	(159)	41.3	(355)	36.9	(266)	2.6	(17)	1.5	(6)

*The 100 percent figures may be slightly higher or lower due to rounding.

9. To what extent do you feel these objectives, as stated, were accomplished during the course?

10. To what extent do you feel more specific objectives should be written and evaluated, for their completion prior to the end of the course?

11. If more specific objectives were written, which would require that the course length be extended, to what extent would you be willing to spend the additional time and money to accomplish the new objectives?

The response ranges to each question were these following choices:

(1) to a very great extent, (2) to a great extent, (3) moderate extent, (4) to a little extent, and (5) to a very little extent.

Of the 670 combined individual responses to the five questions related to the use of performance-based objectives, the largest number 286 or 42.7 percent were satisfied to a "great extent". In all, 66.3 percent or 444 felt satisfied to a "very great" or "great extent". However, there were 10.3 percent or six responses that were not satisfied (to a "little" or "very little extent") presented in Table VI.

The breakdown of the satisfaction index by age is presented in Table VII. Only seven participants under 25 years were satisfied largely to a "very great" or "great extent". This is indicated by 35.0 percent of the total responses. The largest group 11 or 55 percent indicated satisfaction to a "moderate extent" and there were two responses or 10 percent by the under 25 years age group who indicated a lack of satisfaction.

The 25-35 years age group were satisfied largely to a "very great extent" or "great extent". This is indicated by a combined percentage of 59.4. There were 47 responses or 24.7 percent which indicated

TABLE VI
OVERALL RESPONSES TO QUESTIONS CONCERNING SATISFACTION WITH THE
USE OF PERFORMANCE-BASED OBJECTIVES

	Satisfaction Index					Total % (N)
	Very Great extent	Great extent	Moderate extent	Little extent	Very little extent	
	% (N)	% (N)	% (N)	% (N)	% (N)	
Overall Responses	23.6 (158)	42.7 (286)	23.4 (157)	9.0 (60)	1.3 (9)	100* (670)

TABLE VII

OVERALL RESPONSES TO QUESTIONS CONCERNING SATISFACTION WITH
THE USE OF PERFORMANCE-BASED OBJECTIVES BY AGE

Age	Satisfaction Index					Total %* (N)	
	Very Great extent % (N)	Great extent % (N)	Moderate extent % (N)	Little extent % (N)	Very little extent % (N)		
Under 25	15.0 (3)	20.0 (4)	55.0 (11)	10.0 (2)	0	100	(20)
25-35	24.7 (47)	34.7 (66)	24.7 (47)	13.2 (25)	2.6 (5)	100	(190)
35-45	27.0 (58)	40.9 (88)	22.8 (49)	7.9 (17)	1.4 (3)	100	(215)
45-55	18.3 (32)	52.6 (92)	20.0 (35)	8.6 (15)	.5 (1)	100	(175)
Over 55	27.8 (15)	48.1 (26)	22.2 (12)	1.9 (1)	0	100	(54)
Unspecified	18.8 (3)	63.0 (10)	18.8 (3)	0	0	100	(16)
Overall	21.9 (158)	43.2 (286)	27.3 (157)	6.9 (60)	.8 (9)	100	(670)

*The 100 percent figures may be slightly higher or lower due to rounding.

satisfaction to a "moderate extent" and 30 responses or 30.0 percent showed a lack of satisfaction by indicating "little extent" or "very little extent" to some of the questions concerning satisfaction with the quality of instruction by age.

The 35-45 years age group indicated satisfaction by either "very great extent" or "great extent" with 67.9 percent of the total responses. There were 49 responses or 22.8 percent who indicated satisfaction to a "moderate extent" and there were 20 responses or 9.3 percent who were not satisfied.

The 45-55 years group had a high overall satisfaction rate with 124 or 70.9 percent of the responses that were satisfied by either a "very great extent" or "great extent" while 35 or 20.0 percent indicated satisfaction to a "moderate extent". There were 16 responses or 9.1 percent that were not satisfied (to a "little extent" or "very little extent").

But, the over 55 years group were largely satisfied to a "very great extent" or "great extent" by the highest overall rating. This is indicated by a combined percentage of 75.9. There were 12 responses or 22.2 percent which indicated satisfaction to a "moderate extent" and only one response or 1.9 percent that indicated a lack of satisfaction (to a "little extent" or "very little extent").

The breakdown of the satisfaction index by years of experience is presented in Table VIII. Participants having 0-2 years of experience indicated satisfaction to either a "very great extent" or "great extent" with 90 or 60.6 percent of the total responses. There were 43 or 26.1 percent who were satisfied to a "moderate extent". This group also had a high of 22 or 13 percent who indicated they not satisfied (to a "little

TABLE VIII

OVERALL RESPONSES TO QUESTIONS CONCERNING SATISFACTION WITH
THE USE OF PERFORMANCE-BASED OBJECTIVES BY
YEARS OF RELATED EXPERIENCE

Years	Satisfaction Index						Total %* (N)	
	Very Great extent % (N)	Great extent % (N)	Moderate extent % (N)	Little extent % (N)	Very little extent % (N)			
0-2	28.5 (47)	32.1 (53)	26.1 (43)	10.3 (17)	3.0 (5)		100	(165)
2-5	25.0 (45)	42.2 (76)	20.0 (36)	11.7 (21)	1.1 (2)		100	(180)
5-10	17.6 (22)	47.2 (59)	25.6 (37)	9.6 (12)	0		100	(125)
Over 10	22.2 (41)	48.1 (89)	23.3 (43)	5.4 (10)	1.0 (2)		100	(185)
Unspecified	20.0 (3)	60.0 (9)	20.0 (3)	0	0		100	(15)
Overall	22.6 (158)	45.9 (286)	23.0 (157)	7.4 (60)	1.0 (9)		100	(670)

*The 100 percent figures may be slightly higher or lower due to rounding.

extent" or "very little extent"). The 2-5 years experienced group indicated satisfaction by a combined response rate of 121 or 67.2 percent who were satisfied by either a "great extent" or "very great extent". There were 36 or 20.0 percent that were satisfied to a "moderate extent" and there were 23 or 12.8 percent that were not satisfied.

The 5-10 years experienced group had a combined rating of 81 or 64.8 percent who were satisfied to either a "great extent" or a "very great extent". There were 36 or 20.0 percent that were satisfied to a "moderate extent" and there were 23 or 12.8 percent that were not satisfied.

The 5-10 years experienced group had a combined rating of 81 or 64.8 percent who were satisfied to either a "great extent" or a "very great extent". There were 37 or 25.6 percent which were satisfied to a "moderate extent" and 12 or 9.6 percent which were not satisfied (to a "little extent" or "very little extent").

The breakdown of the satisfaction index by job positions is presented in Table IX. The blue collar participants were satisfied largely either to a "great extent" or a "very great extent" with 195 or 69.6 percent. There were 24 responses or 8.5 percent of the blue collar responses not satisfied (to a "little extent" or "very little extent").

The white collar workers indicated a lower satisfaction rating with a combined 238 responses, or 63.5 percent which felt satisfied by either a "great extent" or a "very great extent". There were 92 responses or 24.5 percent of the white collar responses that were satisfied to a "moderate extent", and 45 or 12 percent were not satisfied.

TABLE IX
OVERALL RESPONSES TO QUESTIONS CONCERNING SATISFACTION WITH
USE OF PERFORMANCE-BASED OBJECTIVES
BY JOB POSITION

Job Position	Satisfaction Index						Total %* (N)	
	Very Great extent % (N)	Great extent % (N)	Moderate extent % (N)	Little extent % (N)	Very little extent % (N)			
Blue Collar	20.7 (58)	48.9 (137)	21.8 (61)	6.4 (18)	2.1 (6)		100	(280)
White Collar	25.6 (96)	37.9 (142)	24.5 (92)	11.2 (42)	.8 (3)		100	(375)
Unspecified	27.7 (4)	46.7 (7)	27.7 (4)	0	0		100	(670)
Overall	24.7 (158)	44.5 (286)	24.7 (157)	5.9 (60)	1.0 (9)		100	(670)

*The 100 percent figures may be slightly higher or lower due to rounding.

Use or "Hands-On" Practice Time

Part III of the questionnaire survey dealt with the use of "hands-on" practice time and asked the following questions:

12. To what extent do you believe participants should be put on the spot to perform in practice sessions?
13. To what extent do you believe that sufficient access to the equipment during the practice sessions is important?
14. To what extent should the instructor's presentation prepare you for the practice sessions?
15. To what extent should a participant be "free" to practice using the equipment during the practice?
16. To what extent should a participant receive feedback from the instructor during the practice session?
17. To what extent do you believe the practice sessions should compare, in appropriateness, to typical job situations?

The response range for each question was (1) very great extent, (2) great extent, (3) moderate extent, (4) little extent, (5) very little extent. The responses from questions 12-17 were then combined (Table X) to provide an overall Satisfaction Index average to questions concerning the use of "hands-on" practice time.

Of the 803 combined individual responses to the six questions related to the use of "hands-on" practice time, the largest number 383 or 47.7 percent were satisfied to a "great extent". In all, 78.5 percent or 630 felt satisfied to a "very great" or "great extent". Only 2.9 percent or 24 responses were not satisfied (to a "little" or "very little extent").

TABLE X

OVERALL RESPONSES TO QUESTIONS CONCERNING SATISFACTION WITH
USE OF "HANDS-ON" PRACTICE TIME

	Satisfaction Index					
	Very Great extent % (N)	Great extent % (N)	Moderate extent % (N)	Little extent % (N)	Very Little extent % (N)	Total % (N)
Overall Responses	30.8 (247)	47.7 (383)	18.6 (149)	2.9 (23)	.0 (1)	100* (803)

The breakdown of the satisfaction index by age is presented in Table XI. Participants under 25 years (20) were satisfied largely to a "very great" or "great extent". This is indicated by 83.3 percent of the total responses. There were 12.5 percent indicating satisfaction to a "moderate extent" and there was only one response or 4.2 percent by the under 25 years age group who indicated a lack of satisfaction.

The 25-35 years age group were also satisfied largely to a "very great extent" or "great extent". This is indicated by a combined percentage of 81.2. There were 36 responses or 15.8 percent which indicated satisfaction to a "moderate extent", and seven responses or 3.0 percent that showed a lack of satisfaction by indicating "little extent" or "very little extent" to some of the questions concerning satisfaction with the use of "hand-on" practice time by age.

The 35-45 years age group indicated satisfaction by either "very great extent" or "great extent" with 77.8 percent of the total responses. There were 46 responses or 17.9 percent who indicated satisfaction to a "moderate extent". The 35-45 years group also had 11 responses or 4.3 percent who were not satisfied.

The 45-55 years group indicated satisfaction largely to either a "very great extent" or "great extent" by 75.3 percent of the total responses, while 47 or 22.4 percent indicated satisfaction to a "moderate extent". There were five responses or 2.4 percent that were not satisfied (to a "little extent" or "very little extent").

The over 55 years group were largely satisfied to a "very great extent" or "great extent". This is indicated by a combined percentage of 78.8. The remaining 14 responses or 21.2 percent felt satisfaction to a "moderate extent".

TABLE XI

OVERALL RESPONSES TO QUESTIONS CONCERNING SATISFACTION WITH
THE USE OF "HANDS-ON" PRACTICE TIME BY AGE

Age	Satisfaction Index						Total %* (N)	
	Very Great extent % (N)	Great extent % (N)	Moderate extent % (N)	Little extent % (N)	Very little extent % (N)			
Under 25	37.5 (9)	45.8 (11)	12.5 (3)	4.2 (1)	0		100	(24)
25-35	31.6 (72)	49.6 (113)	15.8 (36)	2.6 (6)	.4 (1)		100	(228)
35-45	32.7 (84)	45.1 (116)	17.9 (46)	4.3 (11)	0		100	(257)
45-55	24.3 (51)	51.0 (107)	22.4 (47)	2.4 (5)	0		100	(210)
Over 55	37.9 (25)	40.9 (27)	21.2 (14)	0	0		100	(66)
Unspecified	33.3 (6)	50.0 (9)	33.3 (3)	0	0		100	(18)
Overall	32.9 (247)	47.1 (383)	20.5 (149)	2.3 (23)	.7 (1)		100	(803)

*The 100 percent figures may vary slightly higher or lower due to rounding.

The breakdown of the satisfaction index by years of experience is presented in Table XII. Participants having 0-2 years of experience indicated a high satisfaction by responding to either a "very great extent" or "great extent" with 166 or 84.3 percent of the total responses. There were 25 or 12.7 percent who were satisfied to a "moderate extent" and only six or 3.0 percent who indicated they were not satisfied (to a "little extent" or "very little extent"). The 2-5 years experienced group indicated satisfaction by a combined response rate of 166 or 76.8 percent who were satisfied by either a "great extent" or "very great extent". There were 41 or 19.0 percent that were satisfied to a "moderate extent" and nine or 4.2 percent that were not satisfied at all.

The 5-10 years experienced group had a combined rating of 115 or 76.7 percent who were satisfied to either a "great extent" or a "very great extent". There were 31 or 20.7 percent which were satisfied to a "moderate extent" and only four or 2.7 percent which were satisfied (to a "little extent" or "very little extent").

The breakdown of the satisfaction index by job positions is presented in Table XIII. The blue collar participants were satisfied largely by either a "great extent" or a "very great extent" with 217 or 78.6 percent. There were only 45 responses that found satisfaction by only a "moderate extent" and 14 or 5.1 percent of the blue collar responses that were not satisfied (to a "little extent" or "very little extent").

The white collar workers indicated a higher satisfaction rating with a combined 386 responses or 90.0 percent which felt satisfaction to either a "great extent" or to a "very great extent". The remaining

TABLE XII
OVERALL RESPONSES TO QUESTIONS CONCERNING SATISFACTION WITH THE
USE OF "HANDS-ON" PRACTICE TIME BY YEARS OF EXPERIENCE

Years	Satisfaction Index						Total %* (N)	
	Very Great extent % (N)	Great extent % (N)	Moderate extent % (N)	Little extent % (N)	Very little extent % (N)			
0-2	38.1 (75)	46.2 (91)	12.7 (25)	2.5 (5)	.5 (1)		100	(197)
2-5	36.1 (78)	40.7 (88)	19.0 (41)	4.2 (9)	0		100	(216)
5-10	18.7 (28)	58.0 (87)	20.7 (31)	2.7 (4)	0		100	(150)
Over 10	27.9 (62)	47.7 (106)	22.1 (49)	7.3 (5)	0		100	(222)
Unspecified	22.2 (4)	61.1 (11)	16.7 (3)	0	0		100	(18)
Overall	28.6 (247)	50.7 (383)	18.2 (149)	3.3 (23)	.1 (1)		100	(803)

*The 100 percent figures may vary slightly higher or lower due to rounding.

TABLE XIII

OVERALL RESPONSES TO QUESTIONS CONCERNING SATISFACTION WITH
THE USE OF "HANDS-ON" PRACTICE TIME BY JOB POSITION

Job Position	Satisfaction Index						Total	
	Very Great extent	Great extent	Moderate extent	Little extent	Very little extent			
	% (N)	% (N)	% (N)	% (N)	% (N)		%*	(N)
Blue collar	31.5 (87)	47.1 (130)	16.3 (45)	4.7 (13)	.4 (1)		100	(276)
White collar	30.0 (149)	47.7 (237)	20.3 (101)	2.0 (10)	0		100	(497)
Unspecified	36.7 (11)	53.3 (16)	10.0 (3)	0	0		100	(30)
Overall	32.7 (247)	49.4 (383)	15.5 (149)	2.2 (23)	.1 (1)		100	(803)

*The 100 percent figures may vary slightly higher or lower due to rounding.

three responses, or 10.0 percent of the white collar responses were satisfied to a "moderate extent". There were 30 non-responses to the questions concerning satisfaction with the use of "hands-on" practice time by job position.

Table XIV shows an overall rating by the respondents of the value the TDW training has been since returning to his/her job. Most of the respondents valued the training to a "great extent"--36.7 percent. However, this rating is lower than the overall average rating to the questions concerning the training itself. The lower rating may be accounted for by the lack of opportunity to use the equipment as noted by some of the respondents.

Additional Comments

The last question in the survey dealt with additional comments the respondent would like to make about the training programs at TDW. The purpose of this question was to solicit a wide range of comments from the respondents for comparative purposes to past class appraisal forms.

The following is a sampling of these comments:

1. The school was not long enough.
2. Too much time spent on individual experiences.
3. Not enough "hands-on" time.
4. Excellent school.
5. The instructor really made us comfortable.
6. Would like more information on the various applications and hazards of using the equipment.
7. Should have tests.

TABLE XIV

OVERALL RESPONSES TO QUESTIONS CONCERNING THE VALUE OF THE
TRAINING SINCE THE RESPONDENT HAS
RETURNED TO HIS/HER JOB

	Satisfaction Index						Total % (N)
	Very Great extent	Great extent	Moderate extent	Little extent	Very little extent		
	% (N)	% (N)	% (N)	% (N)	% (N)		
Overall Response	23.6 (158)	42.7 (286)	23.4 (157)	9.0 (60)	1.3 (9)	100* (670)	

8. The instructor did not take any shortcuts.

9. The instructor spent too much time talking about low pressure equipment.

10. Time ran out so we did not get to set the plugs.

These comments did coincide very closely to the feedback received on past class appraisal forms. This would indicate the class appraisal form is a reliable instrument for collecting data about the quality of the TDW technical training schools.

The findings indicated the respondents placed a high level of importance on: (1) the quality of instruction; (2) the use of performance-based objectives; and (3) the effective use of "hands-on" practice time.

Evidence of this was largely indicated by the overall satisfaction index average rating of all respondents which valued the following areas by a combined ratio of either "very great extent" or "great extent".

1. Quality of instruction - 64.0 percent.
2. Use of performance-based objectives - 66.3 percent.
3. Use of "hands-on" practice time - 78.5 percent.

There were some differences of the perceived importance with respect to the different ages and related work experience. But the ranges were not considered to be a major factor to warrant any type of changes in the basic make-up of the classes.

The most revealing indicator was the percentage of white collar versus blue collar workers who attend the schools (white - 59.7 percent to blue - 34.3 percent). This factor is completely antithetical to what was expected to be the case at the beginning of the survey. The

high percentage of white collar attendees may be an attributing factor for a low participation rate during most of the "hands-on" practice sessions.

There was also a range of lower percentages on final cross-tabulation dealing with the usefulness the training has been to the attendee since he/she has returned to his/her job. The cause of the lower overall ratings may be accountable by the number of respondents who failed to answer this question and by the respondents who did answer the question, but gave a low rating. In both cases, comments were noted that cited a lack of opportunity to use the equipment on the job.

Appendix C contains the overall response totals to all questions asked by the survey. It also provides demographic data of the respondents by their age, years of related experience, and job position.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this chapter is to present a summary of the study and major conclusions. It is divided into the following topical sections: (1) brief summary of purpose and research design, (2) review of research questions and findings, (3) conclusions and implications, (4) recommendations for future research.

The purpose of the research was to present empirical research data concerning the perceived overall effectiveness rating of the TDW technical training schools. This study investigated some characteristics of a good instructor, as evidenced by past research, discussed the varying theories on the usefulness of having and not having performance-based objectives, and considered the typical problems generally associated with doing "hands-on" practice. There has been no prior research by TDW that has investigated the perceived attitudes towards the expectations of participants who attend the TDW technical schools.

This study was exploratory in nature, and utilized a self-administered questionnaire as the basic data gathering tool. The questionnaire survey forms were returned via a self-addressed, postage paid envelope. The respondents were selected from attendance records from 1975 to May, 1982. Only U.S. and Canada participants were selected to respond via a systematic sampling design.

The respondents were asked to indicate their level of importance to the three major elements in the questionnaire survey. They were:

1. Quality of instruction (process),
2. Use of performance based objectives,
3. Effective use of "hands-on" practice time.

A five point likert scale was used. Demographic characteristics were obtained to provide description data on the respondents and to determine the extent of variance in the responses.

The following sections will review the findings with respect to each of the research questions:

Research Question 1

To what extent was having an instructor conscious of the different factors (process) that help create comfortable learning environments for adults perceived to be important by the participants?

The study found the "process" factors had a high degree of importance towards the overall quality of instruction. Cross-tabulations by the different age groups, years of related work experience, and job positions did not have a major bearing on these findings. The value of these responses indicated the instructor of the TDW training schools has been reasonably successful in the past, but would be more successful if he/she possessed a broader understanding of the characteristics of the adult learner, and an understanding of the differences between pedagogical and andragogical instruction.

Research Question 2

To what extent was the use of performance-based objectives perceived to be important in the training program?

The second research question attempted to determine whether a high number of respondents considered knowing the course objectives at the start of the training program to be important, and if a willingness existed to spend more time and money to achieve specifically measurable objectives.

The study found the respondents believed having objectives were important. This was evidenced by an overall response rating of 92.6 and 89.8 percent respectively that indicated either "very great extent" or "great extent" response to the following questions asked in Part II of the survey:

Question 7: To what extent do you believe having course objectives is important?

Question 8: To what extent do you feel the objectives as stated in the beginning, are helpful in completing this course?

However, there seems to be less interest for developing more measurable objectives, and to evaluate them prior to the course completion. This is evidenced by the range of lower responses to the following questions also in Part II of the survey:

Question 10: To what extent do you feel more specific objectives should be written, and evaluated for their completion, prior to the end of the course?

Only 32 or 23.1 percent of the responses to this question wanted more specific objectives written. The majority, 103 or 76.8 percent of the responses were either "somewhat opposed" or "completely opposed" to having more specific objectives written and evaluated for their completion prior to the end of the course.

Question 11: If more specific objectives were written, which would require that the course length be extended, to what extent would you be willing to spend the additional time and money to accomplish the new objectives?

There were 51 or 38.1 percent who indicated a willingness to spend more time and money to accomplish the new objectives. The majority, however, were not willing to spend any more time or money. This is evidenced by the combined response of 83 or 62 percent who responded to the questions by either a "moderate extent" or "very little extent" rating.

Cross-tabulations by the different age groups, years of related work experience, and by job positions supported these findings with only a slight difference in range. The value of these responses indicated the typical participant of the TDW technical training schools attended the schools primarily for information gathering and not basic skill acquisition.

Research Question 3

To what extent was the training function being aware of the problems associated with providing "hands-on" practice perceived to be important by the participants?

The third research question attempted to determine whether a high number of respondents considered the opportunity of being self-directed in the "hands-on" practice sessions important. That is the opportunity for the participant to determine his/her own areas that need improvement and to practice with the equipment only in those areas. The third research question also dealt with the extent of student

involvement the instructor should direct.

Overall responses to these two areas showed the respondent considered both options to be very important. This would indicate the need for the instructor to continue developing the ability to interpret and understand class feelings regarding their interest in the amount and type "hands-on" practice time needed. The instructor should continue being flexible and adaptable during this part of the course so that each participant can practice "freely" with the equipment with only minimal direction as requested.

Cross-tabulations by the different age groups, the different years of related work experience, and the different job positions showed only a slight variance to the overall findings.

Research Question 4

How useful has the TDW training been back on the job?

The fourth research question attempted to determine the overall value the course had been to the participant since he/she had returned to his/her job. The majority of the respondents indicated the training had been useful to them to a "great extent".

Those (35.1 percent) who responded that the training had been useful on to a "moderate" or "lesser" extent, commented the lack of opportunity to use the equipment, or their indirect involvement with the equipment, as the reason for the lower rating. The latter part was important since it indicated that one-third of the participants who attended the TDW schools were again seeking only an awareness of the concepts and applications of the equipment and not necessarily a working knowledge of it.

Research Question 5

What specific areas need to be improved to heighten the overall degree of effectiveness in the following areas:

1. Quality of instruction,
2. Use of performance-based objectives,
3. Use of "hands-on" practice time.

Based on the comments received from the questionnaire survey (Question 22 - Additional comments?), the range of comments were very consistent with those found in past class appraisal forms. The class appraisal should be considered the major communicating tool from the respondents towards improving the effectiveness of the TDW schools. Changes in the appraisal form may be necessary to solicit more open comments from the participants and to lessen the tendency for "straight lining" the rating scales.

Conclusions and Implications

The following section contains the major conclusions and implications that were derived from the study. They are based on the writer's interpretations of the results.

This study identified the basic makeup of a typical class as being white collar workers on almost a 2 to 1 ratio. As stated previously, this factor was completely opposite to earlier thinking, and was a contributing factor towards the lack of class participation during the "hands-on" practice sessions. It was believed the white collar workers were only seeking an understanding of the equipment and not to become proficient in its operation.

The study showed the majority of participants who attended the TDW training schools were between the ages of 35-45 years and have over 10 years experience. This was believed to be a second contributing factor towards the lack of participation during the "hands-on" sessions because the majority of these participants have probably already had much interaction with the equipment.

A final conclusion was that the demographics of the respondents of this survey, and the findings contained herein, supported the notion that the TDW schools, while advertised as basic skill acquisition schools, were actually being used for information gathering sessions for mostly company specific information by the participants.

Recommendations for Future Research

Future research should be conducted in several areas:

1. A study to determine the extent of other related industry's client-centered training programs.
2. A study to determine the extent of impact the E.S.L. students have on the class, and the extent of impact the class has on the E.S.L. students.
3. A study to determine the extent and scope of interest by TDW customers for the purpose of developing a new course which provides information on concepts, applications, and welding recommendations.

Recommendations for Future Practice

In order to achieve a higher overall rating in the quality of TDW technical training schools, future practices should include the following recommendations:

1. That all personnel who might instruct a TDW technical training school be first taught "train the trainer" skills that include characteristics of the adult learner.
2. That all instructors' performance be reviewed in the classroom on a regular basis.
3. That no major changes be made in the basic objectives in the technical training schools at this time.
4. That objectives be written for a new course that offers primarily conceptual and applications knowledge.
5. That the amount of time offered for "hands-on" practice be determined more by the participants individual interests.

Concluding Statement

This study was the first formal review (of record) of the TDW technical training schools. The schools have been and continue to be effective in varying degrees in achieving their overall purpose and objectives. That is to provide that customer with basic operator skills necessary to operate their TDW equipment in a safe and efficient manner.

The study also revealed the need for continuing to develop the staff and classroom practices to achieve higher professional standards. And last, the study revealed the need for becoming more alert and responsive to the interest and concerns of the customer in meeting their training needs.

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APPENDIXES

APPENDIX A

QUESTIONNAIRE SURVEY FORM

Quality of the Instruction

Part I of this survey deals with characteristics any instructor may have in any classroom situation. Your responses to this section will help identify what our participants expect from the instructor when attending a TDW hot tapping and plugging customer training program.

DIRECTIONS: Circle your feelings/response to each question.

1. To what extent should the instructor understand and use the experiences of the class?

1.1	1.2	1.3	1.4	1.5
very great extent	great extent	moderate extent	little extent	very little extent

2. To what extent should the instructor show a willingness to help the individual participant?

2.1	2.2	2.3	2.4	2.5
very great extent	great extent	moderate extent	little extent	very little extent

3. To what extent should the instructor create an informal learning environment?

3.1	3.2	3.3	3.4	3.5
very great extent	great extent	moderate extent	little extent	very little extent

4. To what extent should the instructor show a sense of humor?

4.1	4.2	4.3	4.4	4.5
very great extent	great extent	moderate extent	little extent	very little extent

5. To what extent should the instructor involve the group?

5.1	5.2	5.3	5.4	5.5
very great extent	great extent	moderate extent	little extent	very little extent

6. To what extent should the instructor be flexible and adaptable in the classroom to satisfy the objectives of the participants?

6.1	6.2	6.3	6.4	6.5
very great extent	great extent	moderate extent	little extent	very little extent

-2-

The Use of Performance Objectives

Part II of this survey deals with the use of performance based objectives in the classroom. A performance based objective is simply what a person will know, or be able to do, at the end of the course, and how we will know he/she does know it, and/or can do it.

For review, the course objectives of all TDW hot tapping and plugging schools are the same. They are:

1. To increase equipment installation and operating efficiency
2. To promote safety when using the equipment
3. To promote regular maintenance when using the equipment

Circle your response to each question.

7. To what extent do you believe that having course objectives is important?

7.1	7.2	7.3	7.4	7.5
very great extent	great extent	moderate extent	little extent	very little extent

8. To what extent do you feel these objectives, as stated in the beginning, are helpful in completing this course?

8.1	8.2	8.3	8.4	8.5
very great extent	great extent	moderate extent	little extent	very little extent

9. To what extent do you feel the objectives, as stated, were accomplished during the course?

9.1	9.2	9.3	9.4	9.5
very great extent	great extent	moderate extent	little extent	very little extent

10. To what extent do you feel more specific objectives should be written, and evaluated, for their completion prior to the end of the course?

10.1	10.2	10.3	10.4	10.5
very great extent	great extent	moderate extent	little extent	very little extent

11. If more specific objectives were written, which would require that the course length be extended, to what extent would you be willing to spend the additional time and money to accomplish the new objectives?

11.1	11.2	11.3	11.4	11.5
very great extent	great extent	moderate extent	little extent	very little extent

-3-

The Use of "Hands-On"

Part III of this survey deals with the use of the "hands-on" practice time during the course.

Circle your response to each question.

12. To what extent do you believe participants should be "put on the spot" to perform in the practice sessions?

12.1	12.2	12.3	12.4	12.5
very great	great extent	moderate extent	little extent	very little
extent				extent

13. To what extent do you believe that sufficient access to the equipment during the practice sessions is important?

13.1	13.2	13.3	13.4	13.5
very great	great extent	moderate extent	little extent	very little
extent				extent

14. To what extent should the instructor's presentation prepare you for the practice sessions?

14.1	14.2	14.3	14.4	14.5
very great	great extent	moderate extent	little extent	very little
extent				extent

15. To what extent should a participant be "free" to practice using the equipment during the practice sessions?

15.1	15.2	15.3	15.4	15.5
very great	great extent	moderate extent	little extent	very little
extent				extent

16. To what extent should a participant receive feedback from the instructor during the practice session?

16.1	16.2	16.3	16.4	16.5
very great	great extent	moderate extent	little extent	very little
extent				extent

17. To what extent do you believe the practice sessions should compare, in appropriateness, to typical job situations?

17.1	17.2	17.3	17.4	17.5
very great	great extent	moderate extent	little extent	very little
extent				extent

-4-

General

Please provide the requested information.

18. What is your age?

Under 25 _____
 25 - 35 _____
 35 - 45 _____
 45 - 55 _____
 Over 55 _____

19. How many years' experience do you have in operating TDW hot tapping and plugging equipment?

0 - 2 years _____
 2 - 5 years _____
 5 - 10 years _____
 Over 10 years _____

20. What was your position when you last attended a TDW hot tapping and plugging school?

21. To what extent has your TDW training been useful on the job?

21.1	21.2	21.3	21.4	21.5
very great	great extent	moderate extent	little extent	very little
extent				extent

22. Additional comments?

Thank you for your cooperation in completing this survey. Please Return to:

Jim McDonald
 T. D. Williamson, Inc.
 P. O. Box 3485
 Tulsa, OK 74101

by August 5, 1982.

APPENDIX B

COVER LETTER



T.D. WILLIAMSON, INC.

P.O. BOX 3485 • TULSA, OKLAHOMA 74101 • (318) 743-5501

TELEX 427 2454

(DATE)

(ADR)

Dear Mr. (NAME):

As the training director for T. D. Williamson, Inc's Customer Training Schools, I am constantly looking for ways to measure their effectiveness and improve their quality.

We are requesting your response to the enclosed questionnaire. Your name was chosen from a list of participants who have attended at least one of our hot tapping and plugging schools from the schools' beginning in 1975 to May, 1982. The results of this study will, hopefully, provide the necessary information needed to help evaluate, and improve, our programs in three essential areas:

1. The quality of the instruction
2. The use of objectives in the course
3. The use of the "hands-on" practice time

Because your reply is valuable to use, please take a few minutes now to answer the questions. A stamped, self-addressed envelope is also enclosed to speed your response, which will remain completely anonymous.

I'll look forward to hearing from you by August 5, 1982. Thank you in advance for your cooperation.

Sincerely,

Jim McDonald
Training Director

JSN:jw

Enclosures

APPENDIX C

OVERALL RESPONSE FREQUENCIES

Quality of the Instruction

Part I of this survey deals with characteristics any instructor may have in any classroom situation. Your responses to this section will help identify what our participants expect from the instructor when attending a TDW hot tapping and plugging customer training program.

DIRECTIONS: Circle your feelings/response to each question.

					Total Number of Resp.
1. To what extent should the instructor understand and use the experiences of the class?					
1.1 very great extent	1.2 great extent	1.3 moderate extent	1.4 little extent	1.5 very little extent	
12	66	51	3	2	134
2. To what extent should the instructor show a willingness to help the individual participant?					
2.1 very great extent	2.2 great extent	2.3 moderate extent	2.4 little extent	2.5 very little extent	
44	66	73	1	0	134
3. To what extent should the instructor create an informal learning environment?					
3.1 very great extent	3.2 great extent	3.3 moderate extent	3.4 little extent	3.5 very little extent	
23	62	46	2	1	134
4. To what extent should the instructor show a sense of humor?					
4.1 very great extent	4.2 great extent	4.3 moderate extent	4.4 little extent	4.5 very little extent	
4	29	92	7	1	133
5. To what extent should the instructor involve the group?					
5.1 very great extent	5.2 great extent	5.3 moderate extent	5.4 little extent	5.5 very little extent	
51	72	10	0	1	134
6. To what extent should the instructor be flexible and adaptable in the classroom to satisfy the objectives of the participants?					
6.1 very great extent	6.2 great extent	6.3 moderate extent	6.4 little extent	6.5 very little extent	
25	60	44	4	1	134

Combined Responses 803

-3-

The Use of "Hands-On"

Part III of this survey deals with the use of the "hands-on" practice time during the course.

Circle your response to each question.

					Total Number of Resp.
12. To what extent do you believe participants should be "put on the spot" to perform in the practice sessions?					
12.1 very great extent	12.2 great extent	12.3 moderate extent	12.4 little extent	12.5 very little extent	
37	56	36	5	0	134
13. To what extent do you believe that sufficient access to the equipment during the practice sessions is important?					
13.1 very great extent	13.2 great extent	13.3 moderate extent	13.4 little extent	13.5 very little extent	
64	63	6	1	0	134
14. To what extent should the instructor's presentation prepare you for the practice sessions?					
14.1 very great extent	14.2 great extent	14.3 moderate extent	14.4 little extent	14.5 very little extent	
34	81	19	0	0	134
15. To what extent should a participant be "free" to practice using the equipment during the practice sessions?					
15.1 very great extent	15.2 great extent	15.3 moderate extent	15.4 little extent	15.5 very little extent	
26	51	46	11	0	134
16. To what extent should a participant receive feedback from the instructor during the practice session?					
16.1 very great extent	16.2 great extent	16.3 moderate extent	16.4 little extent	16.5 very little extent	
37	73	19	4	0	133
17. To what extent do you believe the practice sessions should compare, in appropriateness, to typical job situations?					
17.1 very great extent	17.2 great extent	17.3 moderate extent	17.4 little extent	17.5 very little extent	
49	59	23	2	1	134

Combined Responses 803

-4-

General

Please provide the requested information.

18. What is your age?

	Number of Respondents
Under 25	<u>4</u>
25 - 35	<u>38</u>
35 - 45	<u>43</u>
45 - 55	<u>35</u>
Over 55	<u>11</u>
Unspecific	<u>3</u>
	<u>134</u>

19. How many years' experience do you have in operating TDW hot tapping and plugging equipment?

	Number of Respondents
0 - 2 years	<u>33</u>
2 - 5 years	<u>36</u>
5 - 10 years	<u>25</u>
Over 10 years	<u>37</u>
Unspecific	<u>3</u>
	<u>134</u>

20. What was your position when you last attended a TDW hot tapping and plugging school?

White Collar - 80; Blue Collar - 46; Unspecific - 8; Total - 134

21. To what extent has your TDW training been useful on the job?

21.1 very great extent	21.2 great extent	21.3 moderate extent	21.4 little extent	21.5 very little extent	unspecific
36	47	36	6	3	<u>6</u>
					<u>134</u>

22. Additional comments?

Thank you for your cooperation in completing this survey. Please Return to:

Jim McDonald
T. D. Williamson, Inc.
P. O. Box 3485
Tulsa, OK 74101

by August 5, 1982.

²
VITA

JAMES STANLEY MCDONALD

CANDIDATE FOR THE DEGREE OF

MASTER OF SCIENCE

Thesis: PERCEIVED EFFECTIVENESS OF THE TDW TECHNICAL TRAINING SCHOOLS

Major Field: Occupational and Adult Education

Biographical:

Personal Data: Born in Tahlequah, Oklahoma, December 27, 1950,
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Education: Completed the GED in the U.S. Marine Corps in 1970;
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Science Degree in Social Science from Oklahoma State
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Master of Science degree with emphasis in Human Resource
Development at Oklahoma State University in December, 1982.

Professional Experience: Director of Customer Technical Training
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Professional Organizations: Member, American Society for Training
and Development; Member, National Society for Performance
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