PERCEIVED EFFECTIVENESS OF A MAJOR OIL COMPANY TRAINING COURSE

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PERCEIVED EFFECTIVENESS OF

A MAJOR OIL COMPANY

TRAINING COURSE

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CHAPTER I

INTRODUCTION

In December, 1980, an evaluation of the effectiveness of a major oil company's centralized training program during the first year of operation was undertaken (Owens, 1980). The evaluation was general in nature and designed to define any problem areas that needed to be corrected. One of the concerns defined in that study was a need to insure that the skills and technology taught in specific courses met the needs of the various job assignments. The program had been in existence three years and no evaluation had been conducted regarding the perceived effectiveness of specific courses.

Statement of the Problem

The Completions and Workovers course was designed for engineers with a minimum of four months experience in the District office to familiarize them with the principles and operational practices which must be considered to achieve maximum success in completion and workover operations. Within the course, seven skills and/or knowledge are taught. These skills are:

1. To understand reservoir-wellbore relationships and fluid flow characteristics as they relate to well completion and workovers.
2. To be able to select, run and cement production casing.
3. To be able to plan acid job with proper downhole equipment.

4. To understand the mechanics of the perforating process.
5. To be able to plan programs to eliminate formation damage.
6. To be able to determine proper stimulation technique using hydrochloric acid (HCl), hydrofluoric acid (HF) or fracturing (frac).
7. To be able to use the computer to optimize fracturing program.

Because the Completions and Workovers course had not been evaluated, no evaluative information existed.

Purpose of the Study

The purpose of the study was to evaluate the perceived effectiveness and applicability of the skills being taught in a Completions and Workovers course as perceived by the participants and their supervisors.

Research Questions

The specific questions which this study was intended to answer were:

1. How effective and applicable were the skills taught in the following areas as perceived by the participants:
   a. Level of skills learning achieved,
   b. On-the-job opportunity to use the skills,
   c. Effectiveness in using the skills, and
   d. Instructor's ability to teach the skills?
2. How applicable were the skills to the participant's job assignment as perceived by the supervisor?
3. How effectively did the participants use the skills taught in the course as perceived by the supervisor?

4. How does the effectiveness of the participants' skills usage compare as perceived by the participants and the supervisors?

Scope of the Study

The scope of the study was:

1. Limited to selected engineers who participated in the Completions and Workovers course either in September or November, 1982 and their supervisors.
2. Limited to engineers who had not transferred to new locations or resigned from the company during this period.
3. Limited to one engineer and one supervisor from each participating district in the United States and Canada.

Assumptions of the Study

The study reflected the following assumption: that the questionnaire was completed in an honest, thoughtful manner without coercion.

Definition of Terms

The following definitions of terms are provided as used in this study:

Engineer - An individual who graduated from an accredited college or university with a degree in engineering.

Participant - An employee selected to attend a specific training course to attain skills necessary to perform his/her present job assignment more effectively with minimal supervision.

Supervisor - A management representative whose major activity focus is on leading, coordinating and directing the work of others on a daily basis and in face-to-face contact.

Training course - A one to two-week course covering a specific subject to teach the participant skills needed for his/her job.

Completions and Workovers course - A two-week course to teach the principles and operational practices necessary for maximum success in completion and workover operations.

Organization of the Study

Chapter I introduces the study including the statement of the problem, purpose, research questions, scope, assumptions and definition of terms. Chapter II presents a review of literature to determine ways in which other companies have evaluated their training programs. Also included is a history of the training center. Chapter III discusses the procedures used including creation of the questionnaire, selection of the sample, collection and analysis of the data. Chapter IV presents the findings of the questionnaires. The chapter discusses the return rate, the demographic information, the participants' responses, the supervisors' responses, and a comparison of the participants' skills usage as perceived by the participants and the supervisors. Chapter V includes the summary of the research findings, conclusions, and recommendations for future research.

CHAPTER II

REVIEW OF LITERATURE

The review of literature was conducted to determine ways in which other companies evaluate their training programs. The following categories are discussed:

1. The Role of Program Evaluation,
2. Specific Program Evaluations,
3. History of the Training Center, and
4. Summary.

The Role of Program Evaluation

Program evaluation has become a recognized profession with responsibilities beyond determining the cost efficiency of a program. According to Ball and Anderson (1978), evaluation of programs can fulfill any one of six purposes:

1. Analyze need for the program,
2. Assess or certify continuation of program,
3. Determine needed program modifications,
4. Compile evidence for support of a program,
5. Compile evidence for opposition to a program, or
6. Provide research information for understanding basic psychological, social or other processes.

Most evaluations of training programs were conducted to improve and up-date course content.

King (1964) suggests three reviews necessary to determine the effectiveness of a training program. A company review of training allows the company to relate training to its original objectives and to evaluate company performance and any part training has played in improving company performance. This review may indicate needed changes in company policy. A review of the effectiveness of the training services from the opinions of people attending the courses may provide useful additional information. This review may show the training to have reduced costs, reduced length of learning period, improved quality or output or reduced labor turnover. The third review is concerned with the quality of the training techniques and should be continuously evaluated by the training officer. A thorough knowledge of training results can improve the effectiveness of training in the whole organization.

Tracey (1971) indicated that follow-up and evaluation of graduates on-the-job can provide conclusive proof of the adequacy of the training system. A follow-up program should collect information concerning the quality of the job performance of graduates of the training program. This data should be used to validate the system, modify the training objectives, make appropriate changes to system content and adapt the system to remedy deficiencies uncovered. He suggested three methods of collecting follow-up data: on-site follow-up, reports from operating supervisors, and questionnaire surveys.

Specific Program Evaluations

Ball and Anderson (1975) documented 142 technical training programs distributed over the United States which had conducted evaluations.

Following are descriptions of nine training programs and the type of evaluation used.

Navy Drug Abuse Education Specialist Program

The Navy Drug Abuse Education Specialist Program was designed to train personnel to assist in the development of drug and alcohol action programs. Evaluation of the training program was by on-site expert observers to provide program modification and improvement.

Army Digital Subscriber Terminal Equipment Repair Course

The Army Digital Subscriber Terminal Equipment Repair Course was initiated to provide "hands on" training for personnel dealing with military communications and electronics. Formal performance-based measures were used to certify that trainees were able to perform specific tasks. Less formal indicators such as trainee comments and faculty recommendations were also used to evaluate the program. The evaluation data was used to improve the course.

Air Force Air-Traffic Controllers Training Program

The Air Force training program for air-traffic controllers was implemented to provide personnel meeting Federal Aviation Administration requirements the necessary background in electronics to begin on-the-job training. The program evaluation consisted of mailed questionnaires to graduates and supervisors, on-site visits and staff evaluation to revise the curriculum.

Social Security Administration Management-by-Objectives Course

The Management-by Objectives Course was offered by the Social Security Administration to second-level supervisors to encourage skills in defining target outputs and results. An informal evaluation consisting of questionnaires for participant ratings and a critique interview three months after the last workshop was attended was used to provide feedback for the trainers rather than to evaluate effectiveness.

U.S. Department of Agriculture Supervisory Training Phase I

The U.S. Department of Agriculture requires all new supervisors to complete the Supervisory Training Phase I program to develop management skills. Very little evaluation besides trainee informal responses was collected.

Forestry Service Clear Writing Course

The Forestry Service requires employees to complete a minimum of 40 hours of training per year. The Clear Writing Course is one of the training courses offered. Evaluation was conducted by a general open-ended questionnaire administered to a 10 percent sample of participants. The purpose of the evaluation was to document cost savings and other job improvements attributable to the training program.

Food and Beverage Management Program

A program was initiated by a large motel chain in Food and Beverage Management to develop greater trainee expertise to improve

operation efficiency. Evaluation of the program consisted of pre- and post-tests of participants' knowledge, assessment of participants' ability to operate relevant machines, and instructor ratings of the trainees' personal characteristics to up-date the course content and rate trainees' potential.

Medical Laboratory Technician Program

A Medical Laboratory Technician program was developed by a community college to train technicians to meet local employers' needs. Students were evaluated by tests and performance examinations, while the program was evaluated by a committee study and feedback from employers of graduates. Evaluations were conducted to improve the curriculum.

Environmental-Aide Program

An Environmental-Aide Program was designed by a County Vocational Education Center to prepare trainees for employment as assistants in soil conservation, public health, and air-pollution control. The program was evaluated by follow-up surveys with former students and their supervisors to determine job placement and suggestions for program improvement.

T.D. Williamson, Inc. conducted an evaluation of their client-centered technical training school as documented by McDonald (1982). The evaluation was conducted to determine the importance of the quality of instruction, the use of performance-based objectives and the use of "hands-on" practice time. While the findings indicated that all three areas were important, a low interest of participation

was discovered for the "hands on" portion of the schools possibly due to the age and experience level of the participants. The evaluation was used for improving the effectiveness of the training school.

Evaluation of an Apprentice Training Program at the General Motors Assembly Division in Oklahoma City, Oklahoma was reported by Swearengin (1982). The purpose of the evaluation was to assess the effectiveness of the program in fulfilling its goals. Results of the evaluation indicated that the participants felt the program was above average. A follow-up study after the first group of apprentices are graduated was recommended.

History of the Training Center

The Training Center evaluated in this study was established in October, 1978 and began full-scale operation in January, 1979 (Owens, 1980). Because a significant portion of the engineering staff had a low experience level, a company-wide, consistent engineering personnel development program was needed. A centralized training center was therefore created to improve engineering training and relieve local supervisors of an increasing training load brought about by the increased staff size. The development programs were prepared by company-wide task forces in 1978. The programs have been continually modified and up-dated to accomplish the overall training goal to provide intensive and rapid-paced training soon after employment to produce highly productive personnel.

In December, 1980, an evaluation of the effectiveness of the centralized training program during the first year of operation was undertaken. The evaluation was general in nature and provided

direction for needed changes and improvements in the overall program and facilities. One of the concerns noted in that study was that the skills and/or knowledge taught in the courses meet the needs of various job assignments in the production organization. To define the specific skills needed in each course that was developed, committees composed of experienced engineers were formed to provide outlines of necessary course contents appropriate for various work assignments. Evaluation of the courses was left to the Training Center staff. The staff devised course critiques which provided an evaluation of how the participants liked the manner in which the course was taught. Recently, the committees were given the charge of monitoring the Training Center Courses at least once every two years. The monitors, like the participants, attend the course and evaluate the actual course content and teaching method. However, both forms of evaluation fail to evaluate if the skills and/or knowledge taught in the course were effective or applicable after the participants returned to their specific job assignments.

To evaluate skills usage after training, the Training Center staff recommended that questionnaires be sent to selected class participants and their supervisors three to six months after completing a class to evaluate whether the skills and/or knowledge were taught effectively and were applicable to the participant's job assignment. The initial course chosen to be evaluated was Completions and Workovers.

Summary

While evaluation of training programs varies greatly in quality and quantity of analysis, a review of the available literature documents

the presence of some form of evaluation in a great number of training programs. Most evaluation consisted of questionnaires, interviews, and on-site observations of trainees and their supervisors.

CHAPTER III

PROCEDURES

This chapter describes the procedures used to develop and implement the questionnaire to evaluate the perceived effectiveness of a major oil company training course, Completions and Workovers. Procedures included are:

1. Selection of Population and Sample,
2. Development of the Instrument,
3. Collection of Data, and
4. Analysis of Data.

Selection of Population and Sample

The training course, Completions and Workovers, provided for engineers employed by a major oil company had not been evaluated. The course had been in existence three years and an evaluation of its effectiveness was needed. The total population of engineers who completed the course either in September or November, 1982 was 43. A sample of 17 engineers and their immediate supervisors was chosen. The sample did not include engineers who had been transferred to a different job assignment or resigned from the company during this period.

Development of the Instrument

To accomplish the objectives of this research study, data were gathered by use of questionnaires from a sample of past participants (Appendix A) and their supervisors (Appendix B). The questionnaires were designed by the Training Center staff to evaluate the effectiveness of the Completions and Workovers course in meeting the needs of a new engineer assigned to a District office. The questionnaires were then evaluated by people with expertise in program evaluation. Seven skills and/or knowledge taught in the course were identified:

1. Understand reservoir-wellbore relationships and fluid flow characteristics as they relate to well completion and workovers.
2. Ability to select, run and cement production casing.
3. Ability to plan acid job with proper downhole equipment.
4. Understand the mechanics of the perforating process.
5. Ability to plan programs to eliminate formation damage.
6. Ability to determine proper stimulation technique using HCl, HF or fracturing.
7. Ability to use the computer to optimize fracturing program.

The effectiveness was determined by requesting the participants to rate four areas:

1. Level of skills learning achieved,
2. On-the-job opportunity to use the skills,
3. Effectiveness in using the skills, and
4. Instructor's ability to teach the skills.

Additional questions requested were:

1. Deterrents to gaining maximum benefit from the course,
2. Obstacles to effectively using the skills learned,
3. Resources with the most impact on skills usage,
4. Usefulness of the course manual,
5. Overall rating of the course,
6. Topics that should be added,
7. Best aspects of the course,
8. Least liked aspects of the course, and
9. Suggestions for improving the course.

The participant's supervisor was asked to:

1. Indicate the applicability of each skill to the participant's job assignment,
2. Rate the effectiveness of the participant's skills usage,
3. Indicate any performance improvements attributable to the course, and
4. List any additional skills that should be taught.

A ten-point Likert scale was used with values ranging from "very little" (1) to "a lot" (10) and NA for "not applicable".

Collection of Data

Questionnaires were mailed on March 28, 1983 to 17 engineers and their immediate supervisors to be completed and returned by company mail within two weeks. A cover letter was attached to the participant's questionnaire (Appendix C) and to the supervisor's questionnaire (Appendix D) explaining the purpose of the survey.

Analysis of Data

The mean and frequency of each question was tabulated using a statistical computer program, SAS. In addition, frequency bar charts were printed to compare the participants' and supervisors' ratings of the participants' effectiveness in using each of the seven skills. A t-test of similar responses was conducted to show any significant differences in the responses between participants and supervisors (Popham and Sirotnik, 1973). A .01 level of significance was chosen.

CHAPTER IV

RESEARCH FINDINGS

The objective of this chapter is to discuss the findings of the questionnaires. The chapter includes (1) return rate, (2) demographic information, (3) participants' responses, (4) supervisors' responses, and (5) comparison of participants' effectiveness in using the skills taught as perceived by the participant and the supervisor.

Return Rate

A total of 34 questionnaires (17 participants and 17 supervisors) was mailed with 33 questionnaires (17 participants and 16 supervisors) returned for a return rate of 97 percent. One of the participants returned his questionnaire unanswered after the second question because his job assignment following the course did not make use of the material taught.

Demographic Information

To determine the characteristics of the sample studied, certain demographic information was requested. The demographic information is presented in Table I. Eighty-two percent of the participants were male. While all the participants had a degree; the largest number, 7 or 41 percent, had a degree in Petroleum Engineering. Most of the training was designed for new employees as verified by the 47 percent of the

TABLE I

DEMOGRAPHIC CHARACTERISTIC OF PARTICIPANTS

Characteristic	Number	Percent *
Sex		
Male	14	82
Female	3	18
Degree		
Petroleum Engineering	7	41
Mechanical Engineering	3	18
Geological Engineering	2	12
Chemical Engineering	3	18
Other	2	12
Years with Company		
0 - ½	8	47
½ - 1	4	24
1 - 3	3	18
3 - 5	1	6
5 - 8	1	6
Months with Present Assignment		
0 - 3	6	35
3 - 6	8	47
6 - 9	1	6
9 - 12	1	6
12 - 15	1	6
Previous Experience in course area		
Yes		
1 - 6 months	6	35
6 - 12 months	4	24
12 - 18 months	1	6
No	3	18
No Response	3	18

N = 17

* The figures may not total 100 due to rounding.

participants with less than six months' employment. Likewise, the majority of the participants had been assigned to their present job assignment less than six months with 35 percent less than three months and 47 percent from three months to six months. Most of the participants, 65 percent, had previous experience in using the skills and/or knowledge taught by the course; but of those, 35 percent had less than six months' experience with only six percent having more than 12 months' experience.

Participants' Responses

The mean responses for the areas of evaluation by the participants are shown in Table II. Each area of evaluation is discussed below. Responses of 1-3 were rated as low, 4-6 as average, and 7-10 as above-average. See Appendix E for the response totals for each item.

Level of Skills Learning Achieved

The responses by the participants to the level of skills learning achieved rated above-average with a range of 7.2 to 7.9 except for the skill, "ability to select, run and cement production casing". This skill rated 5.1 or average with two responses of "not applicable". The skill, "ability to use the computer to optimize fracturing program", received one response of "not applicable".

On-the-job Opportunity to Use Skills

A wide variation of responses was received when the participants rated on-the-job opportunity to use the skills. Five of the skills were rated from means of 7.1 to 7.8 which is above-average. However,

TABLE II

MEAN RESPONSES FOR AREAS OF EVALUATION
BY PARTICIPANTS

Skills	Learning Level $\bar{X}$	On-Job Opportun. $\bar{X}$	Student Effectiv. $\bar{X}$	Instruct. Ability $\bar{X}$
A. Understand reservoir-wellbore relationships.	7.6	7.1	7.9 (1)	8.7
B. Plan production casing.	5.1 (2)	2.2 (4)	4.0 (7)	7.6 (1)
C. Plan acid job.	7.9	7.3	8.0	8.6
D. Understand perforating process.	7.6	7.2	8.0	9.0
E. Plan elimination of formation damage	7.9	7.6	8.2	8.6
F. Determine proper stimulation technique.	7.6	7.8	8.2	8.4
G. Use computer to optimize frac program.	7.2 (1)	5.4 (3)	7.2 (6)	7.6 (1)

N = 16
( ) = number of "not applicable" responses.

the skill, "ability to use the computer to optimize fracturing program", rated a mean of 5.4 or average with three responses of "not applicable". The skill, "ability to select, run and cement production casing", rated very low with a mean of 2.2 with four responses of "not applicable."

Effectiveness in Skills Usage

The participants rated their effectiveness in using the skills and/or knowledge taught in the course from means of 7.9 to 8.2 or above-average in five of the seven skills. The skill, "ability to use the computer to optimize fracturing program", received a mean rating of 7.2 which is above-average, however, six participants responded that the effectiveness of using the skill was "not applicable". The skill, "ability to select, run and cement production casing", rated a mean of 4.0 with seven participants responding "not applicable".

Instructor's Ability to Teach Skills

The participants rated the instructor's ability to teach the skills from means of 7.6 to 9.0 or above-average. Two skills ("ability to select, run and cement production casing" and "ability to use the computer to optimize fracturing program") received one response each of "not applicable".

Additional Questions

The participants were questioned regarding any deterrents to their gaining the maximum benefit from the course, but 12 participants or 75 percent left this question blank. Four deterrents were noted

which were course structure, manual, inadequate field exposure, and course length.

When asked to rank the obstacles they may have encountered which prevented them from using the skills learned in the course, nine participants or 56 percent did not respond to the question. Six participants or 38 percent responded no to all obstacles listed. Only one participant listed lack of money as an obstacle.

The participants were asked to rank the resource which had the most impact on their using the skills and/or knowledge taught with a rank of 5 for the most impact and 1 for the least impact. The mean response and ranking are summarized in Table III. The manual ranked first as having the most impact followed by the teacher, previous experience and supervisor. Other students had the least impact on the participants' ability to use the skills.

The mean response of the participants' perceived rating of the manual and the overall course analysis is presented in Table IV. The manual was rated above-average in covering lecture material, useful as a field reference, covering troubleshooting, and covering the subject area. The overall rating of the course was 8.5 which was above-average.

Several topics that the participants thought should be added to the course are shown in Table V. The following is a sampling of these topics:

1. Determination of wellbore problems.
2. Coring and core analysis.
3. Nitrogen foam fracs and foamed acid stimulations.
4. Value of cased-hole logs in evaluating workovers.

The best aspects of the course as listed by the participants are

TABLE III

MEAN RESPONSE AND RANK OF IMPACT OF RESOURCES
AS PERCEIVED BY PARTICIPANTS

Resource	$\overline{X}$	Mean Rank
Manual	3.7	1
Teacher	3.5	2
Previous Experience	3.2	3
Supervisor	2.9	4
Other Students	1.8	5

N = 16

TABLE IV

MEAN RESPONSE OF PARTICIPANTS' PERCEIVED RATING OF MANUAL AND OVERALL COURSE

Question	$\bar{X}$
Manual covers lecture material.	8.3
Manual is useful as reference for field work.	7.7
Manual covers troubleshooting.	7.2
Manual covers subject area.	8.1
Overall rating of course.	8.5

N = 16

TABLE V

LISTING OF ADDITIONAL COURSE TOPICS REQUESTED BY PARTICIPANTS

Topics	N
Perforating with tubing-conveyed guns with an underbalance.	1
Oil well cementing and casing practices.	1
Determination of wellbore problems.	1
Coring and core analysis.	1
Better analysis of frac program and design portion.	1
Nitrogen foam fracs and foamed acid stimulations.	1
Value of cased-hole logs in evaluating workovers.	1
Use of cased-hole logs.	1
Overview comparing artificial lift systems.	1
More secondary recovery applications.	1
Various types of artificial lift and their application.	1
Recognition of corrosion problems and mechanisms.	1

presented in Table VI. Seven of the participants listed the instructor and five of the participants listed the frac theory and computer analysis as the best aspect of the course. Also listed were the practicality of the course and field personnel in the class.

The least liked aspect of the course as shown in Table VII was the course length. Seven of the participants felt the course length was too short to cover the frac program. Two participants noted that the material was unorganized with fracturing information in parts of three manuals.

Comments and suggestions by the participants are listed in Table VIII. The comments of five of the participants noted that the course and instructor were excellent. Suggestions to improve the course included:

1. Lengthen course to work on frac program.
2. Shorten frac to only an introduction.
3. Make two one-week courses.
4. Remove frac and make separate course.

Supervisors' Responses

The supervisors were requested to answer questions concerning the applicability of the skills taught and the effectiveness of the participants in using the skills in their job assignments. Two supervisors completed the questionnaire even though their participant's job assignment did not make use of the course material taught. They thought the course was of value to the engineers in providing knowledge needed in other areas. See Appendix F for the response totals for each item.

TABLE VI

COMMENTS BY PARTICIPANTS
ON THE BEST ASPECTS
OF THE COURSE

Comments	N
Instructor.	7
Frac theory and computer analysis.	5
Practicality.	3
Field personnel in class.	2
Introduction of equipment and various jobs they perform.	1
Information of downhole tools.	1
Reinforced on-the-job training.	1

TABLE VII

COMMENTS BY PARTICIPANTS
ON THE LEAST LIKED
ASPECTS OF THE
COURSE

Comments	N
Course length too short to cover frac program.	7
Unorganized - frac information in parts of three manuals.	2
Information on gas wells.	1
Repeat of material received in college.	1
Rock property section.	1
Sections requiring understanding of field equipment and operations.	1

TABLE VIII

SUGGESTIONS AND GENERAL COMMENTS
BY PARTICIPANTS

Suggestions/Comments	N
Excellent course and instructor.	5
Lengthen course to work on frac program.	1
Shorten frac to only an introduction.	1
Make two one-week courses.	1
Remove frac and make it a separate course.	1
Exposure to frac necessary even if not used in present area.	1
Include scale section from Corrosion course.	1
Include foam fracs and foam acid workovers.	1
Include crosslinked gelled acid SPE (Society of Pet. Engrs.) paper.	1
Update technology.	1
Need experts from research to answer questions on workover fluids.	1
More homework with actual well problems.	1
Reorganize manuals and add SPE reprints.	1

Applicability of the Skills Taught

The frequency and percentage of the supervisors' responses concerning the applicability of the skills taught to the participants' job assignment are shown in Table IX. Three skills ("ability to plan acid job with proper downhole equipment", "understand the mechanics of the perforating process", and "ability to plan programs to eliminate formation damage") were applicable in all job assignments. One supervisor, or six percent, felt that two skills ("understand reservoir-wellbore relationships and fluid flow characteristics as they relate to well completion and workovers" and "ability to determine proper stimulation technique using HCl, HF or fracturing") were "not applicable" in his area. Five supervisors, or 31 percent, felt the use of the computer to optimize fracturing program was "not applicable" in their areas. The skill, "ability to select, run and cement production casing", was applicable in only four areas for 25 percent of the responses.

Effectiveness of Participants' Skills Usage

The supervisors rated the effectiveness of the participants' skills usage from means of 5.0 to 7.4 or average as shown in Table X. The skill, "ability to select, run and cement production casing", rated 5.0 with 13 responses of "not applicable". The highest rating of 7.4 was for the skill, "ability to use the computer to optimize fracturing program", however, eight supervisors or 50 percent responded "not applicable".

TABLE IX

FREQUENCY AND PERCENTAGE OF SUPERVISORS' PERCEPTION OF APPLICABILITY OF SKILLS TO PARTICIPANTS' JOB ASSIGNMENT

Skills	Applicable N	Applicable %	Not Applicable N	Not Applicable %
A. Understand reservoir-wellbore relationships.	15	94	1	6
B. Plan production casing.	4	25	12	75
C. Plan acid job.	16	100	0	0
D. Understand perforating process.	16	100	0	0
E. Plan elimination of formation damage.	16	100	0	0
F. Determine proper stimulation technique.	15	94	1	6
G. Use computer to optimize frac program.	11	69	5	31

N = 16

TABLE X

MEAN RESPONSES FOR EFFECTIVENESS OF PARTICIPANTS' SKILLS USAGE AS PERCEIVED BY SUPERVISORS

Skills	$\bar{X}$
A. Understand reservoir-wellbore relationships.	6.8 (1)
B. Plan production casing.	5.0 (14)
C. Plan acid job.	6.7 (1)
D. Understand perforating process.	7.1
E. Plan elimination of formation damage.	7.1 (1)
F. Determine proper stimulation technique.	7.2 (2)
G. Use computer to optimize frac program.	7.4 (8)

N = 16
( ) = number of "not applicable" responses.

Performance Improvements

The supervisors were asked to rate the participants' performance after attending the class as "worse", "same", or "better". The frequency and percentage of the supervisors' perception of the participants' performance after training are shown in Table XI. The largest improvement in the participants' performance was in the area of "need for assistance" with a 62.5 percent response of "better". Two other areas also showed improvement; "self-confidence" and "overall job performance".

Additional Skills Needed

Many suggestions listed in Table XII were made of additional skills needed to be taught in the course. Some of the suggestions were:

1. Discuss new stimulation techniques.
2. Advantages and disadvantages of diverting agents.
3. Use of scale inhibitors.
4. How to post appraise workovers.
5. Mechanisms of additives.
6. Results of low quality workover fluid.

Comparison of Participants' and Supervisors' Responses to Participants' Effectiveness

Both the participants and the supervisors were asked to rate the effectiveness of the participants' use of the skills taught in the course. A comparison of their responses by mean is shown in Table XIII. The participants rated their effectiveness in using the skills taught from means of 4.0 to 8.2. The supervisors rated the participants'

TABLE XI

SUPERVISORS' PERCEPTION OF THE PARTICIPANTS' PERFORMANCE AFTER TRAINING

Performance	Worse N	Same N	Same %	Better N	Better %
Overall job performance.	0	8	50	8	50
Work quantity.	0	12	75	4	25
Work quality.	0	10	62.5	6	37.5
Need for assistance.	0	6	37.5	10	62.5
Salesmanship.	0	12	75	4	25
Self-confidence.	0	7	44	9	56
Help with others.	0	13	81	3	19

N = 16

TABLE XII

SUPERVISORS' SUGGESTIONS FOR ADDITIONAL SKILLS NEEDED

Suggestions	N
Current program satisfactory.	1
Discuss new stimulation techniques.	1
Advantages and disadvantages of diverting agents.	1
Use of scale inhibitors.	1
Tubing stress under cyclic temperature and pressure.	1
How to post appraise workovers.	1
Mechanisms of additives.	1
Demonstration by service companies of downhole equipment.	1
Results of low quality workover fluid.	1
How to design a nitrofied and foamed acid stimulation.	1
Additional discussion on perforating in acid.	1
More actual field problems to solve in class.	1
Mechanics of production testing.	1
Review of wellhead assemblies.	1
Basic understanding of tubing and casing.	1
More on use, application, and limitations of downhole tools.	1

TABLE XIII

COMPARISON OF PARTICIPANTS' AND SUPERVISORS' RESPONSES BY MEAN REGARDING THE PERCEIVED EFFECTIVENESS OF THE PARTICIPANTS' SKILLS USAGE

Skills	Part. Rating $\bar{X}$	Sup. Rating $\bar{X}$	t
A. Understand reservoir-well bore relationships.	7.9 (1)	6.8 (1)	2.11
B. Plan production casing.	4.0 (7)	5.0 (14)	-0.47
C. Plan acid job.	8.0	6.7 (1)	2.76*
D. Understand perforating process.	8.0	7.1	2.22
E. Plan elimination of formation damage.	8.2	7.1 (1)	2.48
F. Determine proper stimulation technique.	8.2	7.2 (2)	2.33
G. Use computer to optimize frac program.	7.2 (6)	7.4 (8)	0.34

N = 16
( ) = number of "not applicable" responses.

* = significant at the .01 level.

effectiveness in using the skills taught from means of 5.0 to 7.4. The skill, "ability to plan acid job with proper downhole equipment", showed a significant difference at the .01 level.

Bar charts were computed to show any differences in the frequency of responses at five midpoint intervals (1, 3, 5, 7, and 9) between the responses of the participants and the supervisors regarding the participants' effectiveness in using each of the seven skills. The frequency of the participants' and the supervisors' responses for Skill A, "understand reservoir-wellbore relationships and fluid flow characteristics as they relate to well completion and workovers", are shown in Figure 1. The supervisors rated four of the participants low and only two of the participants high in their effectiveness to use this skill. Six of the participants, however, rated themselves high with none of the participants rating themselves low in their effectiveness to use this skill. The frequency of responses for Skill B, "ability to select, run and cement production casing", shown in Figure 2 indicated a discrepancy between the participants' responses and the supervisors' responses. While the participants rated themselves low and average in their effectiveness to use this skill, only two supervisors rated their participants' effectiveness (one low and one high). Fourteen supervisors and seven participants responded that the participants' effectiveness in using this skill was "not applicable". As shown in Figure 3, the participants rated their effectiveness to use Skill C, "ability to plan acid job with proper downhole equipment", as high. However, the supervisors rated the participants' effectiveness as average. Likewise as shown in Figure 4, all but two of the participants responded that their effectiveness

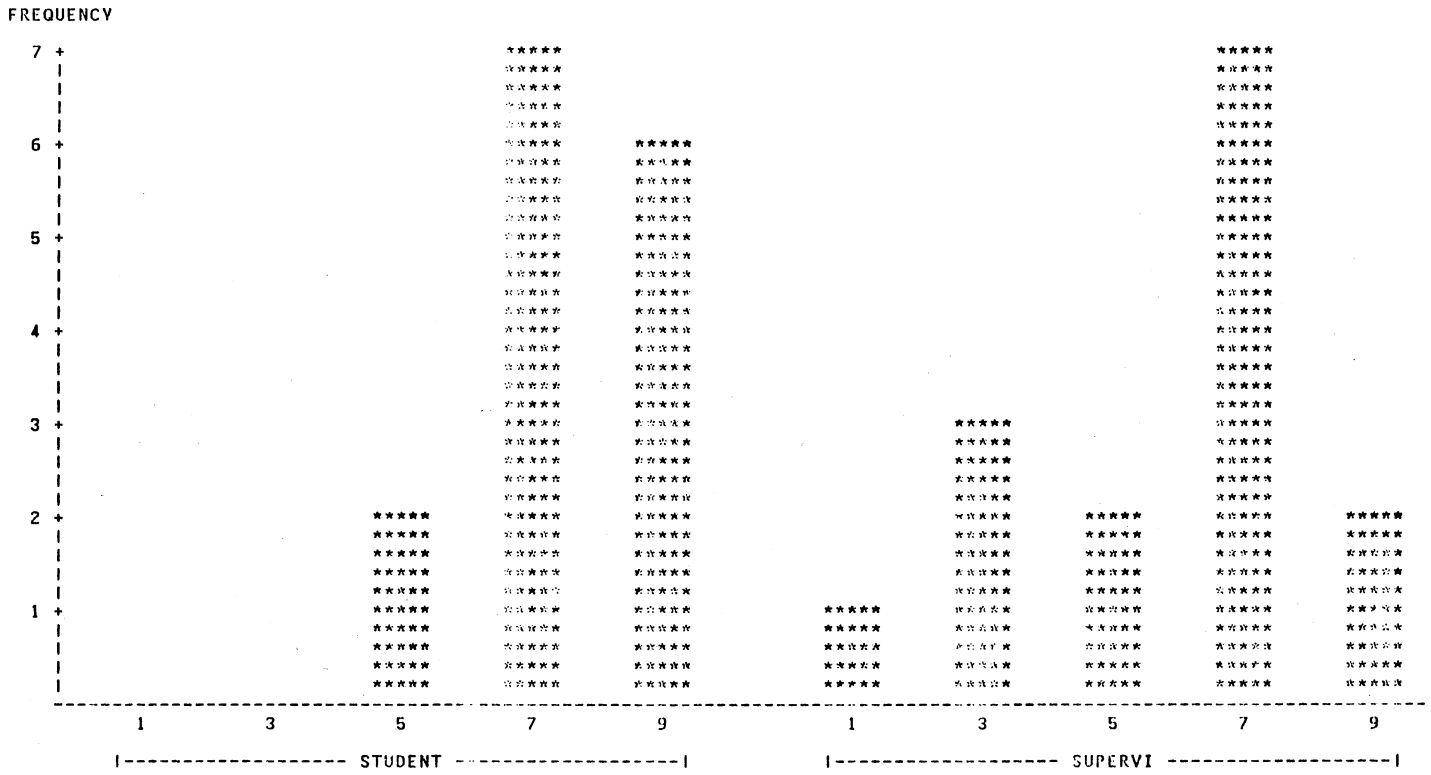

Figure 1. Frequency Bar Chart of Skill A, Understand Reservoir-Wellbore Relationships, Responses Regarding Effectiveness of Participants' Skill Usage For Both Groups

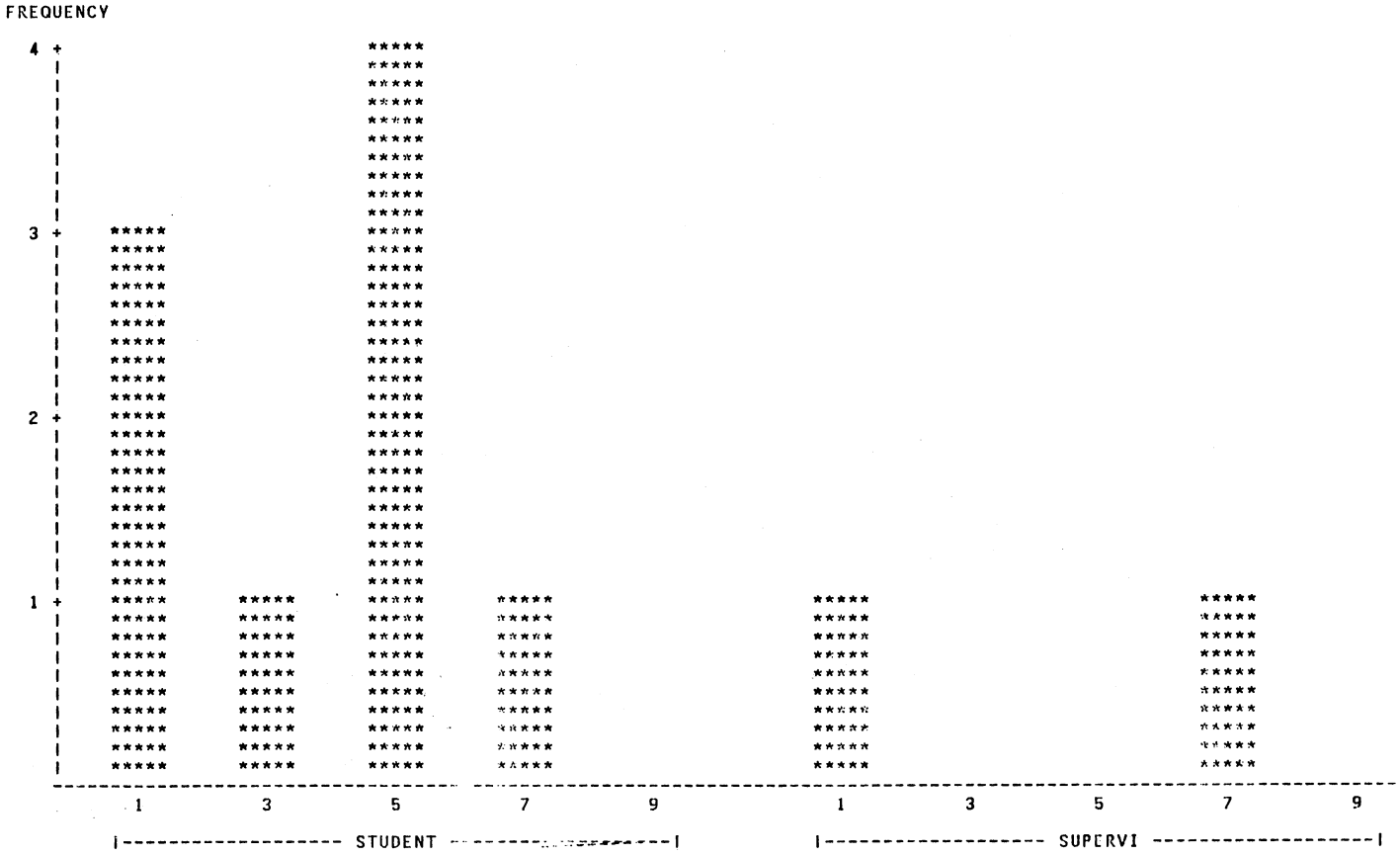

Figure 2. Frequency Bar Chart of Skill B, Plan Production Casing, Responses Regarding Effectiveness of Participants' Skill Usage For Both Groups

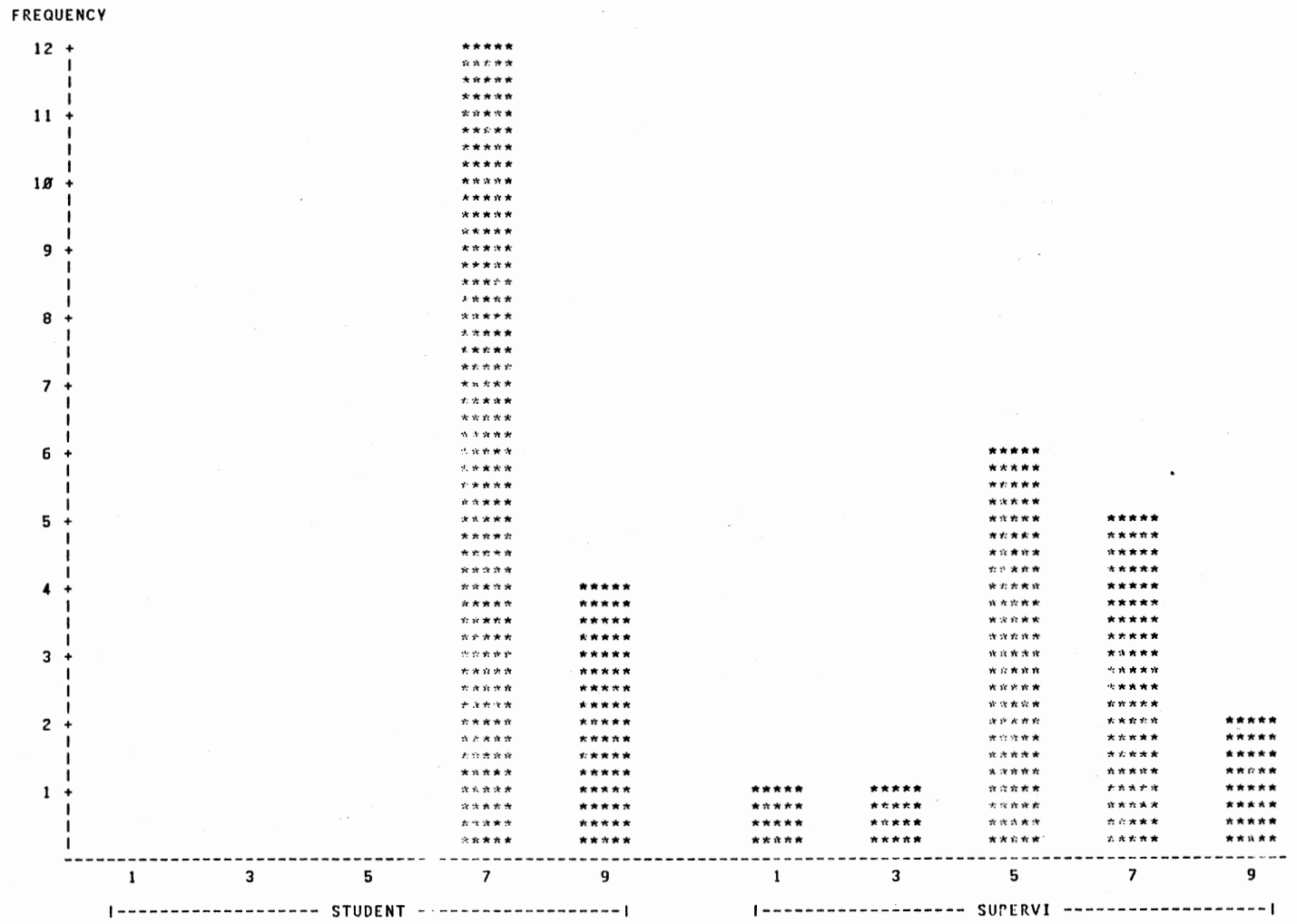

Figure 3. Frequency Bar Chart of Skill C, Plan Acid Job, Responses Regarding Effectiveness of Participants' Skill Usage For Both Groups

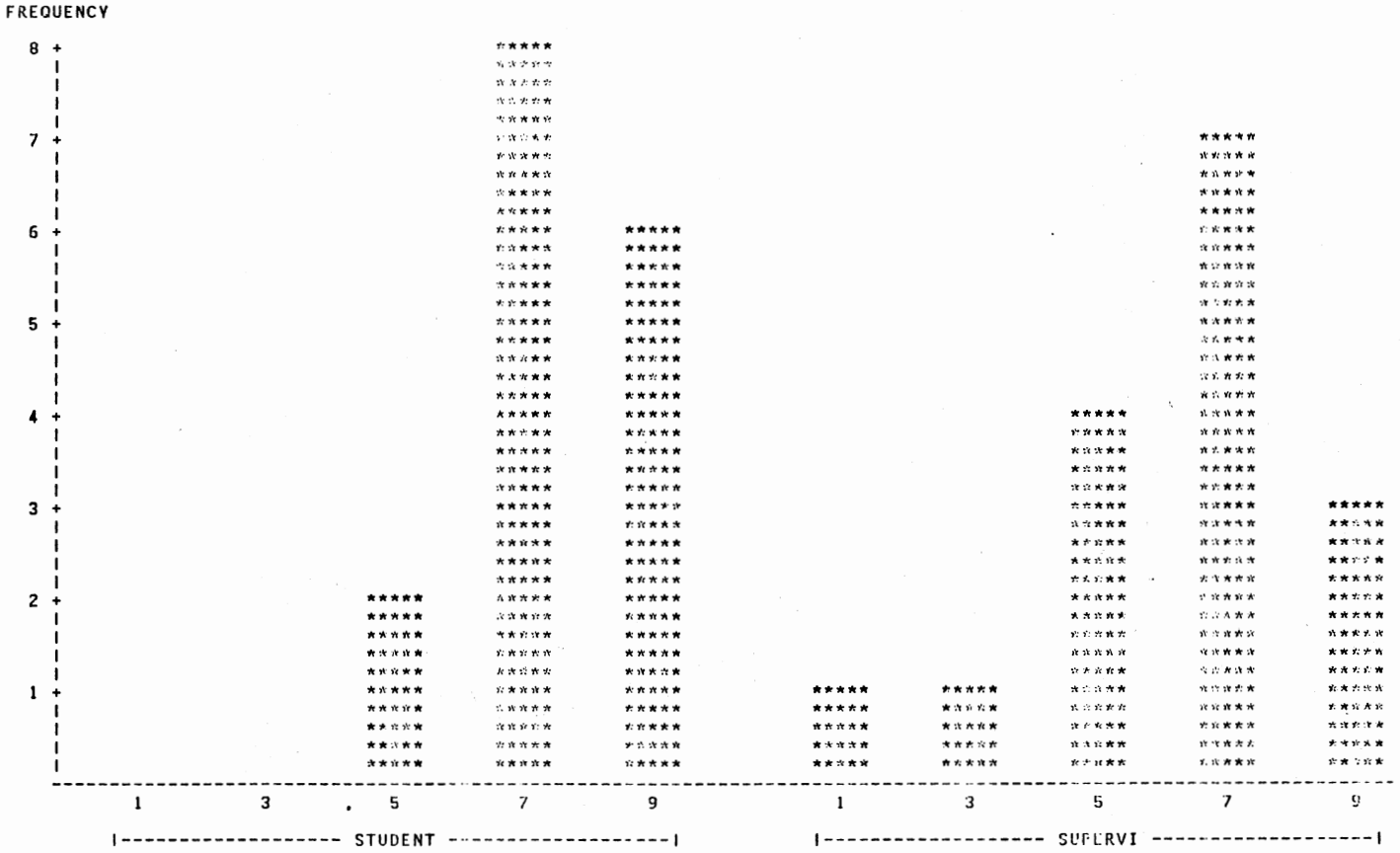

Figure 4. Frequency Bar Chart of Skill D, Understand Perforating Process, Responses Regarding Effectiveness of Participants' Skill Usage For Both Groups

to use Skill D, "understand the mechanics of the perforating process", was high. Ten of the 16 supervisors rated their participants' effectiveness to use this skill as high with two supervisors rating their participants low. A similar pattern can be seen in Figure 5 which shows the responses for the participants' effectiveness to use Skill E, "ability to plan programs to eliminate formation damage". While eight of the participants and eight of the supervisors responded in the 7-8 interval, seven participants and only two supervisors responded in the 9-10 interval. The remaining five supervisors rated their participants' effectiveness to use this skill average or below. A discrepancy between the participants' and the supervisors' perception of the participants' effectiveness to use Skill F, "ability to determine proper stimulation technique using HCl, HF or fracturing", can be seen in Figure 6. While all 16 of the participants rated their effectiveness in using this skill as high, the supervisors rated the participants' effectiveness in a wider range with two low, three average and nine high. Responses regarding the participants' effectiveness to use Skill G, "ability to use the computer to optimize fracturing program", are shown in Figure 7. Eight of the participants rated their effectiveness in using this skill as high with two low responses. Three of the supervisors rated their participants' effectiveness as average or below with five responses in the high range. Six participants and eight supervisors responded "not applicable".

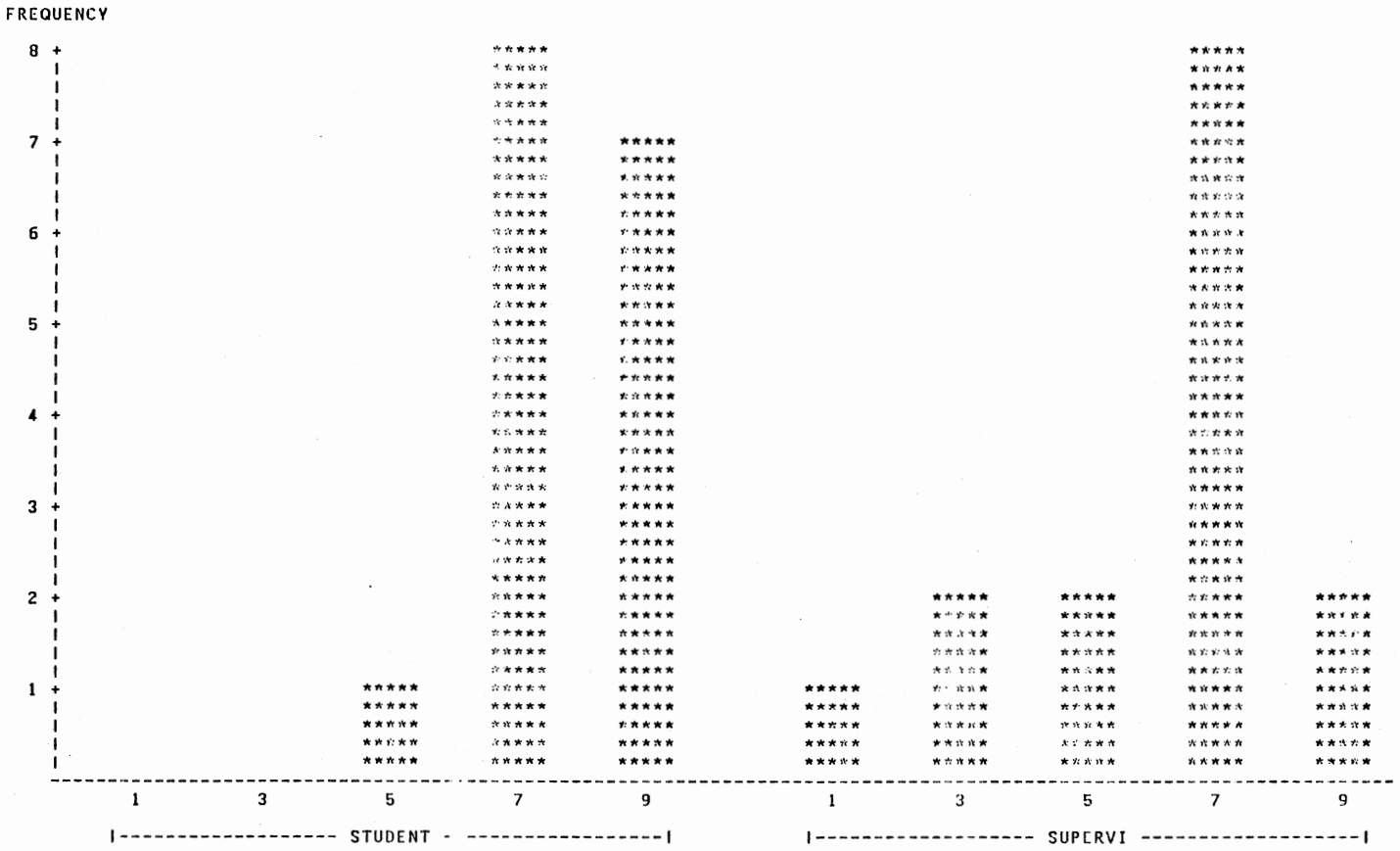

Figure 5. Frequency Bar Chart of Skill E, Plan Elimination of Formation Damage, Responses Regarding Effectiveness of Participants' Skill Usage For Both Groups

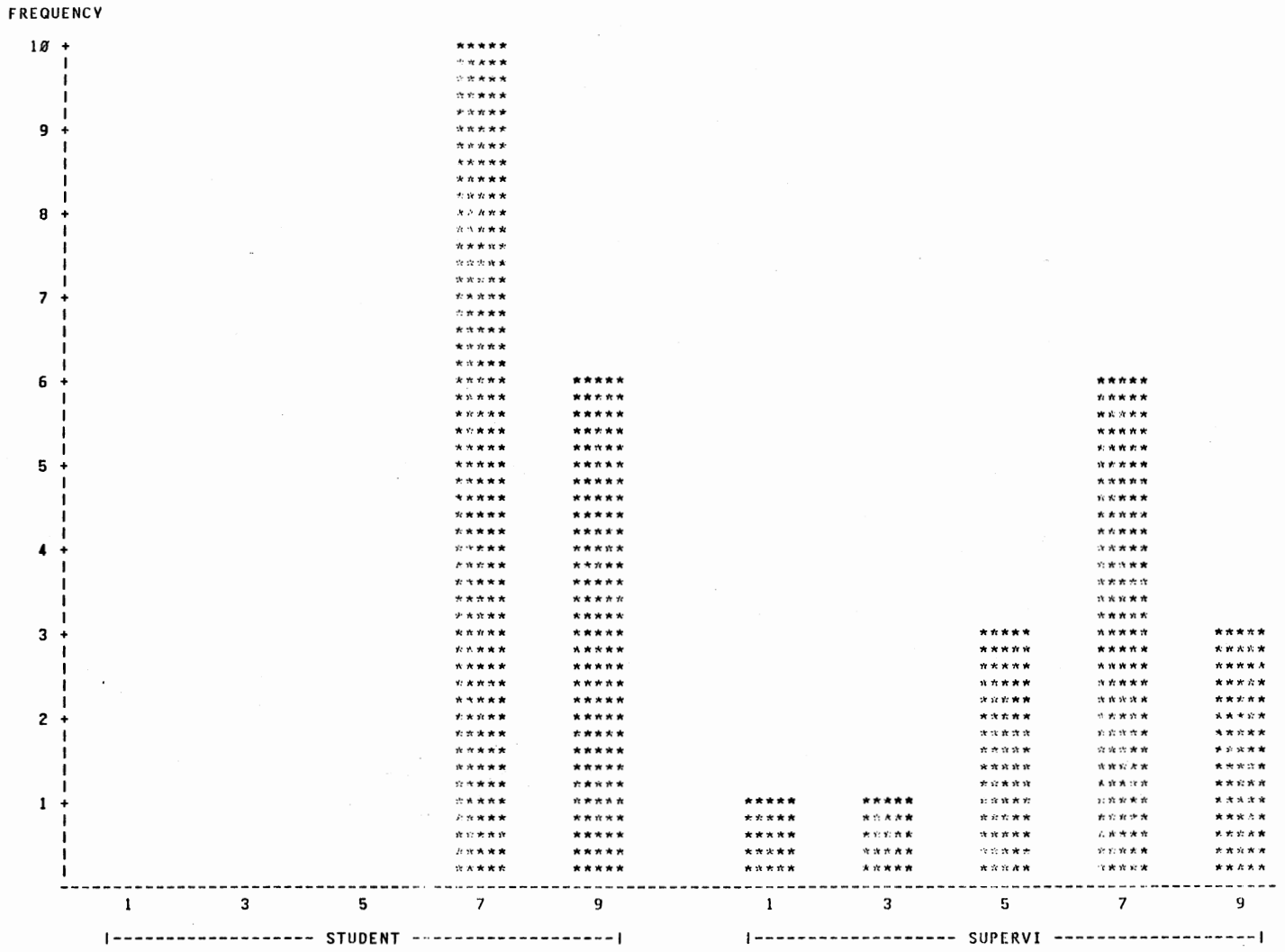

Figure 6. Frequency Bar Char of Skill F, Determine Proper Stimulation Technique, Responses Regarding Effectiveness of Participants' Skill Usage For Both Groups

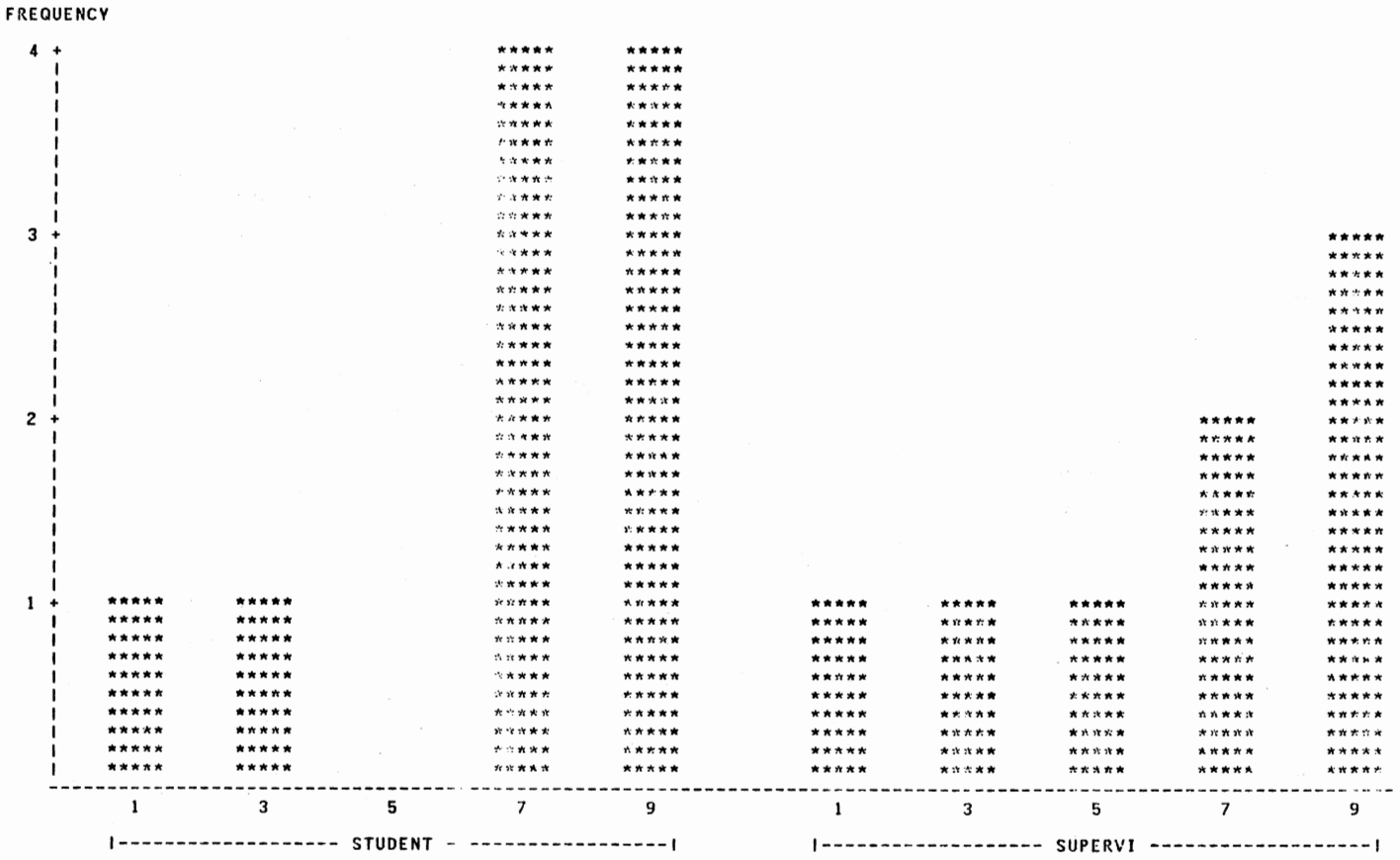

Figure 7. Frequency Bar Chart of Skill G, Use Computer to Optimize Frac Program, Responses Regarding Effectiveness of Participants' Skill Usage For Both Groups

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents a summary of the research study and the conclusions reached from analysis of the data. The topics included are:

1. Summary,
2. Conclusions, and
3. Recommendations.

Summary

The purpose of the research was to evaluate the perceived effectiveness and applicability of the skills being taught in the course Completions and Workovers. The study used a questionnaire to gather data. The sample consisted of one engineer who attended class either in September or November, 1982 and his/her immediate supervisor from each participating district in the United States and Canada.

To evaluate the Completions and Workovers course, seven skills and/or knowledge taught in the course were identified. The participants were asked to rate these skills in four areas: how well he/she had learned the skills and/or knowledge, how much on-the-job opportunity to use the skills and/or knowledge, how effective was he/she in using the skills and/or knowledge since returning to the job assignment, and how well did the instructor teach the skills and/or knowledge. The

supervisors were asked to rate their perception of the participants' effectiveness in using the skills, the applicability of the skills to participants' job assignment and any performance improvements attributable to the course.

A ten-point Likert scale was used. Demographic characteristics were obtained to denote descriptive characteristics of the course participants.

Conclusions

Of concern was the effectiveness of the training in teaching skills and/or knowledge applicable to the job assignment and the ability to use the skills and/or knowledge effectively three to six months after training with minimal supervision. As identified by the study, the average participant in the course was an engineer with less than one year experience. Therefore, basic and practical field skills are necessary for the engineer to become productive.

Conclusions drawn from this study indicated that these skills and/or knowledge were effectively taught as perceived by the participants and the supervisors. Two skills, however, showed some areas needing further evaluation regarding their applicability to the participants' job assignment. The discrepancies noted between the participants' and the supervisors' responses regarding the participants' effectiveness in using the skills may be a lack of awareness by the supervisor because the engineers are trained to work with minimal supervision. The participants' job performance was perceived by the supervisors to have improved after attending the course. Overall, the course and instructor were considered by the past participants to be excellent.

Recommendations for Practice

This study was the first evaluation of the participants' effec iveness in using skills taught in Completion and Workovers course. While the course has been and continues to be very effective in teachi the skills, periodic evaluation of the skills usage after training is needed. The recommendation from this study would be to:

1. Spend less time on the skill, "ability to select, run and cement production casing", and
2. Expand the time spent on the skill, "ability to use the computer to optimize fracturing program".

Recommendations for Future Research

Further study is needed to:

1. Determine actual access and usage of computers in the districts to optimize fracturing programs.
2. Determine if job assignments for entry level engineers need to be modified to include the ability to select, run and cement production casing.
3. Evaluate other training center courses.

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APPENDIXES

APPENDIX A

PARTICIPANT'S QUESTIONNAIRE

Course: Completions & Workovers
Date of Attendance: _____
Attachment VIII

PARTICIPANT QUESTIONNAIRE

Name _____ (Optional)

Hire Date with _____ Degree _____

Present Job Assignment _____ Date of Assignment _____

Today's Date _____

DIRECTIONS:

All questions below are to be answered by circling or checking the appropriate answer.

Questions:

1. Did your job assignment following this course make use of the material taught?

   Yes _____ No _____

   If "No", answer Question #2 and stop.

2. Did you have previous experience using the skills and/or knowledge covered by this course?

   Yes _____ No _____

   If yes, how long? _____

3. This course was designed to teach you the following skills and/or knowledge. Rate on a scale of 1-10 the level of learning you feel you achieved upon completion of this course. (Circle the appropriate number.)

Skills	Very Little				Average					A Lot	
A. Understand reservoir-wellbore relationships and fluid flow characteristics as they relate to well completion and workovers.	1	2	3	4	5	6	7	8	9	10	NA*
B. Ability to select, run, and cement production casing.	1	2	3	4	5	6	7	8	9	10	NA
C. Ability to plan acid job with proper downhole equipment.	1	2	3	4	5	6	7	8	9	10	NA

*Not Applicable

3. (cont.)

Skills	Very Little									A Lot	
D. Understand the mechanics of the perforating process.	1	2	3	4	5	6	7	8	9	10	NA
E. Ability to plan programs to eliminate formation damage.	1	2	3	4	5	6	7	8	9	10	NA
F. Ability to determine proper stimulation technique using HCL, HF or fracturing.	1	2	3	4	5	6	7	8	9	10	NA
G. Ability to use computer to optimize fracturing program.	1	2	3	4	5	6	7	8	9	10	NA

4. If you feel that there was a deterrent to your gaining the maximum benefit from this course, please circle the reason(s):

A. Improper work or education background
B. Lack of interest at that time
C. Course content
D. Course structure
E. Manual
F. Instructor
G. Training facilities
H. Hotel facilities
I. Personal problems
J. Other _____
_____
_____

5. Please evaluate your on-the-job opportunity to use or apply these skills and/or knowledge.

Skills	Very Little									A Lot	
A. Understand reservoir-wellbore relationships and fluid flow characteristics as they relate to well completion and workovers.	1	2	3	4	5	6	7	8	9	10	NA
B. Ability to select, run, and cement production casing.	1	2	3	4	5	6	7	8	9	10	NA
C. Ability to plan acid job with proper downhole equipment.	1	2	3	4	5	6	7	8	9	10	NA

5. (cont.)

Skills	Very Little				Average					A Lot	
D. Understand the mechanics of the perforating process.	1	2	3	4	5	6	7	8	9	10	NA
E. Ability to plan programs to eliminate formation damage.	1	2	3	4	5	6	7	8	9	10	NA
F. Ability to determine proper stimulation technique using HCL, HF or fracturing.	1	2	3	4	5	6	7	8	9	10	NA
G. Ability to use computer to optimize fracturing program.	1	2	3	4	5	6	7	8	9	10	NA

6. Now that you have had the opportunity to use these skills and/or knowledge, rate your effectiveness in their use.

Skills	Very Little				Average					A Lot	
A. Understand reservoir-wellbore relationships and fluid flow characteristics as they relate to well completion and workovers.	1	2	3	4	5	6	7	8	9	10	NA
B. Ability to select, run, and cement production casing.	1	2	3	4	5	6	7	8	9	10	NA
C. Ability to plan acid job with proper downhole equipment.	1	2	3	4	5	6	7	8	9	10	NA
D. Understand the mechanics of the perforating process.	1	2	3	4	5	6	7	8	9	10	NA
E. Ability to plan programs to eliminate formation damage.	1	2	3	4	5	6	7	8	9	10	NA
F. Ability to determine proper stimulation technique using HCL, HF or fracturing.	1	2	3	4	5	6	7	8	9	10	NA
G. Ability to use computer to optimize fracturing program.	1	2	3	4	5	6	7	8	9	10	NA

7. Please rate the instructor's ability to teach the following skills and/or knowledge.

	Skills	Very Little				Average				A Lot		
A.	Understand reservoir-wellbore relationships and fluid flow characteristics as they relate to well completion and workovers.	1	2	3	4	5	6	7	8	9	10	NA
B.	Ability to select, run, and cement production casing.	1	2	3	4	5	6	7	8	9	10	NA
C.	Ability to plan acid job with proper downhole equipment.	1	2	3	4	5	6	7	8	9	10	NA
D.	Understand the mechanics of the perforating process.	1	2	3	4	5	6	7	8	9	10	NA
E.	Ability to plan programs to eliminate formation damage.	1	2	3	4	5	6	7	8	9	10	NA
F.	Ability to determine proper stimulation technique using HCL, HF or fracturing.	1	2	3	4	5	6	7	8	9	10	NA
G.	Ability to use computer to optimize fracturing program.	1	2	3	4	5	6	7	8	9	10	NA

8. Please rate the course manual you received and used on the following:

	Skills	Poor			Average					Excellent	
A.	Covers lecture material	1	2	3	4	5	6	7	8	9	10
B.	Useful as reference for field work.	1	2	3	4	5	6	7	8	9	10
C.	Covers troubleshooting.	1	2	3	4	5	6	7	8	9	10
D.	Covers subject area.	1	2	3	4	5	6	7	8	9	10

9. Considering your needs in your present job assignment, what is your overall rating of this course?

Very Poor			Average					Very Good	
1	2	3	4	5	6	7	8	9	10

10. List specific topics or skills that should be added to this course to make it more useful in your job.

    A.

    B.

    C.

11. Rank the resource which had the most impact on your using the skills and/or knowledge presented in this course after returning to your job assignment (5 for the most impact to 1 for the least impact).

    A. Manual _____
    B. Teacher _____
    C. Other Students _____
    D. Supervisor _____
    E. Previous Experience _____

12. If you were unable to use the skills and/or knowledge gained in this course after returning to your job assignment, rank the obstacles you may have encountered using this scale:

    (5) Definitely yes
    (4) Yes
    (3) Not applicable
    (2) No
    (1) Definitely no

    A. Lack of equipment _____
    B. Lack of money _____
    C. Lack of supervisor support _____
    D. Lack of support personnel _____
    E. Lack of training _____
    F. Lack of educational background _____

13. After taking this course and returning to your work location, did you discuss with your supervisor what skills and/or knowledge you learned in this course and their application in your job assignment?

    Yes _____ No _____

14. Has this course motivated you to do additional self-learning in this subject area?

    Yes _____ No _____

15. What did you like best about this course?

16. What did you like least about this course?

17. What suggestions do you have for improving this course?

18. Other comments.

Please feel free to contact the training center manager or coordinator if you wish to discuss this questionnaire or the training course in more detail.

APPENDIX B

SUPERVISOR'S QUESTIONNAIRE

Course: Completions & Workovers
Date of Attendance: _____
Attachment IX

SUPERVISORS QUESTIONNAIRE

Name _____ (Optional)

Name of Trainee _____

Today's Date _____

DIRECTIONS:

All questions below are to be answered by circling or checking the appropriate answer.

Questions:

1. To your knowledge did the trainee have any work experience in this area of technology before attending this course?

   Yes _____ No _____ Don't Know _____

2. Did the trainee continue to work in this technological area after attending the course?

   Yes _____ No _____ If no, please explain.

   _____

   _____

   _____

3. If this course was not available at Production Training Center, would you have sent the trainee to an outside course on the same topic?

   Yes _____ No _____

4. This course was designed to teach the following skills and/or knowledge to the trainee. Please indicate which of these are applicable or not to the trainee's job assignment in this technology area.

	Skills	Applicable	Not Applicable
A.	Understand reservoir-wellbore relationships and fluid flow characteristics as they relate to well completion and workovers.	A	NA
B.	Ability to select, run, and cement production casing.	A	NA
C.	Ability to plan acid job with proper downhole equipment.	A	NA

4. (cont.)

Skills	Applicable	Not Applicable
D. Understand the mechanics of the perforating process.	A	NA
E. Ability to plan programs to eliminate formation damage.	A	NA
F. Ability to determine proper stimulation technique using HCL, HF or fracturing.	A	NA
G. Ability to use computer to optimize fracturing program.	A	NA

5. Please indicate the degree of effectiveness in which the trainee is using these skills. (Circle the appropriate number).

Skills	Effectiveness										
Skills	Very Little			Average						A Lot	
A. Understand reservoir-wellbore relationships and fluid flow characteristics as they relate to well completion and workovers.	1	2	3	4	5	6	7	8	9	10	NA*
B. Ability to select, run, and cement production casing.	1	2	3	4	5	6	7	8	9	10	NA
C. Ability to plan acid job with proper downhole equipment.	1	2	3	4	5	6	7	8	9	10	NA
D. Understand the mechanics of the perforating process.	1	2	3	4	5	6	7	8	9	10	NA
E. Ability to plan programs to eliminate formation damage.	1	2	3	4	5	6	7	8	9	10	NA
F. Ability to determine proper stimulation technique using HCL, HF or fracturing.	1	2	3	4	5	6	7	8	9	10	NA
G. Ability to use computer to optimize fracturing program.	1	2	3	4	5	6	7	8	9	10	NA

*Not Applicable

6. What additional skills should be taught to make this course more useful in job assignment in this technological area?

   A.

   B.

   C.

   D.

7. Has the attendee's performance changed in any of the following areas following attendance at this course?

		Worse	Same	Better
A.	Overall Job Performance	1	2	3
B.	Work Quantity	1	2	3
C.	Work Quality	1	2	3
D.	Need for Assistance	1	2	3
E.	Salesmanship	1	2	3
F.	Self Confidence	1	2	3
G.	Help with Others	1	2	3

8. Other comments.

APPENDIX C

PARTICIPANT'S COVER LETTER

Tulsa, Oklahoma

FILE: WWO- -934.35

EVALUATION OF TRAINING EFFECTIVENESS

A few months ago you attended a _____ course at the Production Training Center. It is the purpose of the enclosed questionnaire to assess the effectiveness of this course in meeting your job needs in the work area covered by this course. You will note from the questions that we are trying to evaluate not only whether the "right" technology and skills are being taught, and the effectiveness of the instruction, but also how you feel about both your opportunity and ability to use the technology.

A similar questionnaire has been provided your
to obtain a viewpoint on your utilization of the technology and the overall impact of this course on your job attitude, performance, etc.

The questionnaire should take no more than 15-20 minutes to complete. We hope that you will be willing to take this time to help us evaluate and make whatever changes are needed in the course so that it will better meet company needs. It is not mandatory that you sign the questionnaire, but by knowing your job location we perhaps can better assess outside factors that interfere with your effective application of newly learned skills and technology.

Please complete and return the questionnaire within two weeks. We appreciate your help in this effort to improve and update our courses.

Wm. W. Owens

WWO:
Enclosure

APPENDIX D

SUPERVISOR'S COVER LETTER

Tulsa, Oklahoma

FILE: WWO- -934.35

EVALUATION OF TRAINING EFFECTIVENESS

The Production Training Center has initiated a program whose purpose is to assess whether the technology and skills being taught in our various courses is appropriate to the needs of specific job assignments within our company. During the remainder of ____, we will be sending out questionnaires to many of our course participants and their supervisors to help us in this assessment.

We have forwarded one of these questionnaires to _____, an engineer from your Staff, who attended the _____ course several months ago. The response will help us to define whether the technology and skills being taught in that course are appropriate to the job assignment, the effectiveness of the instructor, and the participant's opportunity and ability to use the technology.

Your questionnaire contains similar questions on the appropriateness of skills and technology taught, but additionally seeks your opinion on the participant's effectiveness in using the technology and comments on "side effects" that may contribute to the participant doing a better overall job for .

The questionnaire should take no more than 15-20 minutes to complete. If you feel that the participant's immediate supervisor is better acquainted than yourself with the participant's job activities and performance, you may wish to have the supervisor complete the questionnaire, or at least provide some input. It is our hope that candid and complete responses to the questionnaire by both the course participants and their supervisors will pinpoint course inadequacies whose correction will result in our courses better preparing your subordinates for more effective job performance.

We would appreciate receiving both your response and the participant's within two weeks. The success of this training effectiveness assessment is entirely dependent upon the contribution of you and your staff.

Wm. W. Owens

WWO:
Attachment

APPENDIX E

PARTICIPANT'S OVERALL RESPONSE FREQUENCIES

Course: Completions & Workovers
Date of Attendance: _____
Attachment VIII

PARTICIPANT QUESTIONNAIRE

Name _____ (Optional)

Hire Date with _____ Degree _____

Present Job Assignment _____ Date of Assignment _____

Today's Date _____

DIRECTIONS:

All questions below are to be answered by circling or checking the appropriate answer.

Questions:

1. Did your job assignment following this course make use of the material taught?

   Yes 16 No 1

   If "No", answer Question #2 and stop.

2. Did you have previous experience using the skills and/or knowledge covered by this course?

   Yes 11 No 3 No Response 3

   If yes, how long? _____

3. This course was designed to teach you the following skills and/or knowledge. Rate on a scale of 1-10 the level of learning you feel you achieved upon completion of this course. (Circle the appropriate number.)

Skills	Very Little			Average				A Lot				
A. Understand reservoir-wellbore relationships and fluid flow characteristics as they relate to well completion and workovers.	1	2	3	4[1]	5	6	7[7]	8[4]	9[3]	10[1]	NA*	7.6
B. Ability to select, run, and cement production casing.	1	2[2]	3[1]	4[2]	5[4]	6[2]	7	8[3]	9	10	NA[2]	5.1
C. Ability to plan acid job with proper downhole equipment.	1	2	3	4	5	6[1]	7[3]	8[9]	9[3]	10	NA	7.9

*Not Applicable

3. (cont.)

Skills	Very Little			Average						A Lot		
D. Understand the mechanics of the perforating process.	1	2	3	4	5[2]	6[2]	7[3]	8[4]	9[3]	10[2]	NA	7.6
E. Ability to plan programs to eliminate formation damage.	1	2	3	4	5[1]	6[2]	7	8[7]	9[6]	10	NA	7.9
F. Ability to determine proper stimulation technique using HCL, HF or fracturing.	1	2	3	4	5	6[1]	7[5]	8[8]	9[2]	10	NA	7.6
G. Ability to use computer to optimize fracturing program.	1	2[1]	3	4[1]	5	6[2]	7[3]	8[4]	9[3]	10[1]	NA[1]	7.2

4. If you feel that there was a deterrent to your gaining the maximum benefit from this course, please circle the reason(s):

A. Improper work or education background
B. Lack of interest at that time
C. Course content
1 D. Course structure
1 E. Manual
F. Instructor
G. Training facilities
H. Hotel facilities
I. Personal problems
2 J. Other _____
_____
_____

5. Please evaluate your on-the-job opportunity to use or apply these skills and/or knowledge.

Skills	Very Little			Average						A Lot		
A. Understand reservoir-wellbore relationships and fluid flow characteristics as they relate to well completion and workovers.	1[1]	2	3	4[1]	5[2]	6[2]	7[1]	8[3]	9[4]	10[2]	NA	7.1
B. Ability to select, run, and cement production casing.	1[6]	2[3]	3	4	5[1]	6	7	8[1]	9	10	NA[4]	2.2
C. Ability to plan acid job with proper downhole equipment.	1[1]	2	3	4	5[2]	6[3]	7[1]	8[4]	9[2]	10[3]	NA	7.3

5. (cont.)

	Skills	Very Little			Average					A Lot			
		1	2	3	4	5	6	7	8	9	10	NA	
D.	Understand the mechanics of the perforating process.			1	1	3	1	1	4	2	3		7.2
E.	Ability to plan programs to eliminate formation damage.				2	1	2	1	2	6	2		7.6
F.	Ability to determine proper stimulation technique using HCL, HF or fracturing.					2	1	4	2	5	2		7.8
G.	Ability to use computer to optimize fracturing program.	5				1		2		4	1	3	5.4

6. Now that you have had the opportunity to use these skills and/or knowledge, rate your effectiveness in their use.

	Skills	Very Little			Average					A Lot			
		1	2	3	4	5	6	7	8	9	10	NA	
A.	Understand reservoir-wellbore relationships and fluid flow characteristics as they relate to well completion and workovers.					1	1	3	4	6		1	7.9
B.	Ability to select, run, and cement production casing.	3			1	3	1		1			7	4.0
C.	Ability to plan acid job with proper downhole equipment.							5	7	3	1		8.0
D.	Understand the mechanics of the perforating process.					1	1	3	5	4	2		8.0
E.	Ability to plan programs to eliminate formation damage.						1	3	5	6	1		8.2
F.	Ability to determine proper stimulation technique using HCL, HF or fracturing.							3	7	6			8.2
G.	Ability to use computer to optimize fracturing program.	1			1			1	3	4		6	7.2

7. Please rate the instructor's ability to teach the following skills and/or knowledge.

	Skills	Very Little			Average						A Lot				
A.	Understand reservoir-wellbore relationships and fluid flow characteristics as they relate to well completion and workovers.	1	2	3	4	5	6	7[1]	8[7]	9[4]	10[4]	NA			8.7
B.	Ability to select, run, and cement production casing.	1	2	3	4	5	6[4]	7[2]	8[6]	9[2]	10[1]	NA[1]			7.6
C.	Ability to plan acid job with proper downhole equipment.	1	2	3	4	5	6	7	8[9]	9[5]	10[2]	NA			8.6
D.	Understand the mechanics of the perforating process.	1	2	3	4	5	6	7[1]	8[3]	9[7]	10[5]	NA			9.0
E.	Ability to plan programs to eliminate formation damage.	1	2	3	4	5	6[1]	7[2]	8[4]	9[5]	10[4]	NA			8.6
F.	Ability to determine proper stimulation technique using HCL, HF or fracturing.	1	2	3	4	5	6[1]	7[1]	8[6]	9[6]	10[2]	NA			8.4
G.	Ability to use computer to optimize fracturing program.	1	2	3[1]	4	5[1]	6[1]	7[2]	8[5]	9[4]	10[1]	NA[1]			7.6

8. Please rate the course manual you received and used on the following:

	Skills	Poor			Average						Excellent		NA	
A.	Covers lecture material	1	2	3	4	5	6[1]	7	8[9]	9[4]	10[1]		1	8.3
B.	Useful as reference for field work.	1	2	3[1]	4	5	6[1]	7[2]	8[8]	9[2]	10[1]		1	7.7
C.	Covers troubleshooting.	1	2	3	4	5[1]	6[3]	7[5]	8[4]	9[2]	10		1	7.2
D.	Covers subject area.	1	2	3	4	5[1]	6	7[3]	8[5]	9[5]	10[1]		1	8.1

9. Considering your needs in your present job assignment, what is your overall rating of this course?

Very Poor			Average						Very Good		
1	2	3	4	5	6	7[2]	8[6]	9[6]	10[2]		8.5

10. List specific topics or skills that should be added to this course to make it more useful in your job.

    A.

    B.

    C.

11. Rank the resource which had the most impact on your using the skills and/or knowledge presented in this course after returning to your job assignment (5 for the most impact to 1 for the least impact).

A.	Manual	3.7
B.	Teacher	3.5
C.	Other Students	1.8
D.	Supervisor	2.9
E.	Previous Experience	3.2

12. If you were unable to use the skills and/or knowledge gained in this course after returning to your job assignment, rank the obstacles you may have encountered using this scale:

    (5) Definitely yes
    (4) Yes
    (3) Not applicable
    (2) No
    (1) Definitely no

		1/2	3	4/5
A.	Lack of equipment	6	1	
B.	Lack of money	6		1
C.	Lack of supervisor support	7		
D.	Lack of support personnel	7		
E.	Lack of training	7		
F.	Lack of educational background	7		

    No Response 9

13. After taking this course and returning to your work location, did you discuss with your supervisor what skills and/or knowledge you learned in this course and their application in your job assignment?

    Yes 11 No 5

14. Has this course motivated you to do additional self-learning in this subject area?

    Yes 16 No 0

15. What did you like best about this course?

16. What did you like least about this course?

17. What suggestions do you have for improving this course?

18. Other comments.

Please feel free to contact the training center manager or coordinator if you wish to discuss this questionnaire or the training course in more detail.

APPENDIX F

SUPERVISOR'S OVERALL RESPONSE FREQUENCIES

Course: Completions & Workovers
Date of Attendance: _____
Attachment IX

SUPERVISORS QUESTIONNAIRE

Name _____ (Optional)

Name of Trainee _____

Today's Date _____

DIRECTIONS:

All questions below are to be answered by circling or checking the appropriate answer.

Questions:

1. To your knowledge did the trainee have any work experience in this area of technology before attending this course?

   Yes 13 No 3 Don't Know ____

2. Did the trainee continue to work in this technological area after attending the course?

   Yes 14 No 2 If no, please explain.

   _____
   _____
   _____

3. If this course was not available at Production Training Center, would you have sent the trainee to an outside course on the same topic?

   Yes 12 No 4

4. This course was designed to teach the following skills and/or knowledge to the trainee. Please indicate which of these are applicable or not to the trainee's job assignment in this technology area.

Skills	Applicable	Not Applicable
A. Understand reservoir-wellbore relationships and fluid flow characteristics as they relate to well completion and workovers.	A 15	NA 1
B. Ability to select, run, and cement production casing.	A 4	NA 12
C. Ability to plan acid job with proper downhole equipment.	A 16	NA 0

4. (cont.)

Skills	Applicable	Not Applicable
D. Understand the mechanics of the perforating process.	A 16	NA 0
E. Ability to plan programs to eliminate formation damage.	A 16	NA 0
F. Ability to determine proper stimulation technique using HCL, HF or fracturing.	A 15	NA 1
G. Ability to use computer to optimize fracturing program.	A 11	NA 5

5. Please indicate the degree of effectiveness in which the trainee is using these skills. (Circle the appropriate number).

Skills	Very Little				Average					A Lot		
A. Understand reservoir-wellbore relationships and fluid flow characteristics as they relate to well completion and workovers.	1	2[1]	3[2]	4[1]	5[1]	6[1]	7[1]	8[6]	9[2]	10	NA*[1]	6.4
B. Ability to select, run, and cement production casing.	1	2[1]	3	4	5	6	7	8[1]	9	10	NA[14]	5.0
C. Ability to plan acid job with proper downhole equipment.	1	2[1]	3[1]	4	5[2]	6[4]	7[2]	8[3]	9[1]	10[1]	NA[1]	6.4
D. Understand the mechanics of the perforating process.	1	2[1]	3	4[1]	5[4]	6	7[3]	8[4]	9[3]	10	NA	6.6
E. Ability to plan programs to eliminate formation damage.	1	2[1]	3	4[2]	5[1]	6[1]	7[2]	8[6]	9[2]	10	NA[1]	6.7
F. Ability to determine proper stimulation technique using HCL, HF or fracturing.	1	2[1]	3	4[1]	5[1]	6[2]	7[3]	8[3]	9[2]	10[1]	NA[2]	6.9
G. Ability to use computer to optimize fracturing program.	1	2[1]	3[1]	4	5[1]	6	7	8[2]	9[2]	10[1]	NA[8]	6.8

*Not Applicable

6. What additional skills should be taught to make this course more useful in job assignment in this technological area?

   A.

   B.

   C.

   D.

7. Has the attendee's performance changed in any of the following areas following attendance at this course?

		Worse		Same		Better	
A.	Overall Job Performance	1	0	2	8	3	8
B.	Work Quantity	1	0	2	12	3	4
C.	Work Quality	1	0	2	10	3	6
D.	Need for Assistance	1	0	2	6	3	10
E.	Salesmanship	1	0	2	12	3	4
F.	Self Confidence	1	0	2	7	3	9
G.	Help with Others	1	0	2	13	3	3

8. Other comments.

VITA[2]

Norma J. Williams

Candidate for the Degree of

Master of Science

Thesis: PERCEIVED EFFECTIVENESS OF A MAJOR OIL COMPANY TRAINING COURSE

Major Field: Occupational and Adult Education

Biographical:

Personal Data: Born in Asheville, North Carolina, November 28, 1943, the daughter of Mr. and Mrs. M. P. Rogers.

Education: Graduated from Ellsworth High School, Ellsworth, Kansas, in May 1961; received Bachelor of Arts degree in General Science from Fort Hays State University in 1965; completed requirements for the Master of Science degree with emphasis in Human Resource Development at Oklahoma State University in July, 1983.

Professional Experience: Math and Science Teacher, Graham Park Junior High, 1967-68; Technical Writer, Amoco Research Center, 1968-73; Social Worker, Oklahoma Department of Social and Rehabilitative Services, 1973-75; Supervisor Printing and Microfilming, Saint Francis Hospital, 1979-82; Technical Writer, Amoco Production Training Center, 1982-Present.