Introduction
While training has long been an important element in the workplace, it is gaining new importance as organizations implement team-based structures. Raelin includes the learning component in a list of factors for success in teams where every member participates in leadership. The training required to equip employees for effective participation in a team-based organization stretches across several of the types of training defined by Dubois and Rothwell: orientation training, which “helps individuals become socialized into a corporate culture,” qualifying training, which “helps people become productive, meeting the basic performance expectations of the work they're hired to perform,” cross-training, which “helps people master new jobs or new job skills,” and retraining, which “provides upgrading to keep skills current as technological or organizational conditions change” (48). One or more of these types of training may be applicable depending upon where the organization and the individual are in the life cycle of the team-based organization.

While training is gaining new importance with the advent of the team-based organization, there is still a need to prove its worth. Dubois and Rothwell emphasize the importance of training evaluation, stating that, “decision makers are increasingly demanding to know what returns they receive for their expensive investments” (56). Their work suggests that training evaluation include a skills assessment both before and after the training, and performance of actual or simulated work by the trainees that will be compared to the training objectives. The work of others, such as Ed Hubbard, also stresses the importance of proving the value of training to the organization.

Problem
With the implementation of team-based organization principles in the workplace, team members need to be equipped with formal problem-solving methods and feel confident in their ability to apply such methods. It is difficult to justify soft-skill training in the workplace and to identify effective training methods. In the studied organization, a single-session (two-hour), on-site training is currently in use and is provided by an external training resource. The effectiveness of this training in equipping team members with formal problem-solving methods and increasing their confidence in their problem-solving abilities is unknown.
**Research Question**
Does the currently-used problem-solving training equip team members with a set of formal problem-solving methods and result in an increase in team members’ confidence in their problem-solving abilities?

**Hypothesis**
The currently-used problem-solving training equips team members with a formal set of methods for problem-solving and increases team members’ confidence in their problem-solving abilities.

**Variables**
*Independent variables.* The workforce in question consists of both administrative and operative associates in both leadership and non-leadership roles. Associates function as members of various work teams, which are defined functionally. Study participants will vary in educational background, years and type of work experience, and problem-solving background prior to the training.

*Dependent variables.* Study participants will be provided with the currently-used, formal problem-solving training to allow for study of the effects of the training.

**Outcomes**
After participating in the training, team members will find that they are equipped with either newly acquired or updated formal problem-solving skills. Those who have never had training or experience using these types of formal methods will have a new skill set. Those who have previously had training or experience in problem-solving will find their skills updated or reinforced. This addition or reinforcement of formal problem-solving methods to the team members’ skill sets will increase team members’ confidence in their problem-solving abilities.

**Research Methods and Design**
*Study method.* The qualitative descriptive research method of sampling and surveys will be used to conduct the study. Participants will be presented with a questionnaire prior to and after the training. The questionnaire will include both self-perception questions and application questions. The purpose of the self-perception questions will be to gather data regarding the participants’ perception of their current problem-solving skill level and their confidence in their formal problem-solving abilities. The application questions will serve as a simulation of work to
allow for comparison to the training objectives. To represent actual workplace situations as closely as possible, the application questions will use specific examples of workplace problems (gathered from the team members’ work environment) to test the participants’ likelihood and ability to apply formal problem-solving methods. For the post-training questionnaire, participants may refer to reference materials supplied in the training, as the intention is not to measure the participants’ ability to memorize the problem-solving steps but rather to gauge their likelihood and ability to use them. The questionnaires will include multiple-choice questions, questions for which an interval scale will be used for responses, and very limited open-ended questions (such as listing or short-answer questions).

The questionnaires will be distributed and completed individually. Subsequent to the individual completion of the questionnaires (both prior to and following the training), the participants will be asked to participate in focus groups. In each focus group session, participants will be invited to join in a guided discussion as a follow-up to the questionnaire. The responses and outcomes from the focus group sessions will be recorded and used as a supplement to the questionnaires in evaluating the training.

Participant selection. The participant group will consist of team members who complete the problem-solving training. Each training group (session) includes team members of varying educational background, years and type of work experience, and problem-solving background. For example, each training group includes members from both administrative and operative teams, salaried and non-salaried positions, leadership and non-leadership roles, and positions requiring varying levels and types of education. Using one such training group as study participants will provide a random sampling of the total workforce to which the training is available.

Definition of study terms. Formal problem-solving methods include such steps as identifying the problem, root-cause analysis, brainstorming possible solutions, testing solutions, implementing a solution, and evaluating the implemented solution. Likelihood of applying formal problem-solving methods (ref. questionnaire description) refers to the participants’ frequency of referencing the formal problem-solving methods as an approach to a given problem. Ability to apply formal problem-solving methods (ref. questionnaire description) refers to the participants’ ability to not only reference the terminology of the formal problem-solving methods but to execute those methods. Team member confidence in their
problem-solving skills refers to their comfort level and to their perception of their own ability and effectiveness in problem-solving in the team environment.

Results. The results of the questionnaires prior to the training will be compiled, as will the results of the questionnaires administered after the training, and the compiled results will be compared. This comparison of pre-training and post-training questionnaire results should demonstrate the effectiveness of the training in equipping participants with formal problem-solving methods and the impact of the training on participants’ confidence in their problem-solving abilities.

Subsequent Research
While this study will demonstrate the effectiveness of the training across the overall, general population of participants, it will not fully investigate the effectiveness of the training within specific categories of participants, such as administrative, operative, leadership, and non-leadership (reference Independent variables). Ongoing study should limit the selection of study participants based on independent variables to determine the effectiveness of the training on the various groups and to demonstrate whether variations in training methods are needed to more effectively serve these different groups.
Works Consulted


Training Evaluation Questionnaire

Team Effectiveness: Problem Solving Training

Conducted by:
Amy Cochran McCraw
May 2004
Dear Study Participant,

As part of our ongoing series of Team Effectiveness training sessions, we are conducting an evaluation of the recent session of training in Problem Solving. This is an evaluation of the training, not the participant, and is intended to support the effectiveness and continuous improvement of the training. There are no right or wrong answers; all feedback is valuable.

The participant background information is solely for the purpose of insuring that a variety of backgrounds are represented in the questionnaire results and for summarizing those results.

The questionnaire activity and completion should take approximately 20 minutes. Please complete both the participant background and the training questionnaire.

One week following the questionnaire completion, participants will be invited to a focus group session to further follow up on the training and the questionnaire. Additional details and a meeting invitation will be forthcoming.

Thank you for your helpful participation and feedback.

Regards,

Amy C. McCraw
Participant Background

(Please print or write legibly)

Name: ________________________________________________

Current Position: ___________________________ No. Years in Position: ___

Education:

___High school  ___Associates Degree
___Bachelor’s Degree  ___Graduate Degree or other post-baccalaureate study

Work experience:

Position: ___________ No. Years in Position: ___

Position: ___________ No. Years in Position: ___

Formal problem solving experience:

___ Years ___ Months

Level of experience:

___ Beginner ___ Basic
___ Intermediate ___ Expert

Problem solving training history:

___No formal (classroom or other structured program) training
___Some informal training on-the-job
___Formal training, company-sponsored seminar or training session
___Formal training, part of college curriculum

Participant Signature: ___________________ Date: ___________

Manager’s Approval for Questionnaire & Focus Group Participation:

Signature: ___________________ Date: ___________
Problem Solving Training Questionnaire

(Please print or write legibly)

The questionnaire consists of four sections. Sections One through Four consist of short-answer questions about problem solving. Section Four provides a simulation exercise related to problem solving in the work environment. Please answer all questions, following the instructions provided in each section. If you have completed the Team Effectiveness Problem Solving Training, you may use your class materials.

Section One
Please respond to the questions below by circling the letter(s) for all correct answers for each question. Please note that each question may have one or more correct answers.

1. The steps of formal problem solving include, but are not limited to:
   a. Identify the problem
   b. State the problem clearly
   c. List probable causes
   d. Investigate the root cause of the problem
   e. Assign the corrective action to the responsible party
   f. Choose one solution
2. A problem is:
   a. An opportunity for improvement
   b. A puzzle looking for an answer
   c. A disturbance or unsettled matter that demands a solution
   d. A challenge for a team
3. Problems can be classified into three groups, including:
   a. Problems that have already occurred or are occurring now
   b. Problems that you want to detect and forestall
   c. Identified problems that lie ahead
   d. Potential problems resulting from upcoming organizational changes
4. What causes a problem?
   a. Personality conflicts
   b. Change
   c. Team dynamics
   d. Employee attitudes
5. A problem or potential problem can be recognized by:
   a. Identifying that there is a gap between what you expect to happen and what actually happens
   b. Identifying that there is a gap between what you would like to have occur in the future and the potential for mishaps based on your procedures
   c. Recognizing opportunities for your team to fall short of its targets
   d. Spotting a gap between actual and expected performance
Section Two
Please respond to the questions below by circling one response from the scale of 1-5, where 1 = Strongly Disagree and 5 = Strongly Agree.

1. I feel well-equipped with formal, structured techniques for problem solving.
   1 2 3 4 5

2. Sufficient problem solving training has been provided by my company.
   1 2 3 4 5

3. Most of my skills in problem solving are a result of on-the-job experience.
   1 2 3 4 5

4. Most of my skills in problem solving are a result of education outside of the workplace.
   1 2 3 4 5

5. Most of my skills in problem solving are a result of problem solving training provided by my company.
   1 2 3 4 5

Section Three
Please respond briefly to the following questions.

1. What are the S.M.A.R.T. Standards?

2. How can you recognize the need for a decision?

Section Four
Please briefly describe how you would apply the systematic steps of problem solving to the following workplace problem. List each systematic problem solving step and give an example or examples of problem solving activity at each step (the solution(s) does not have to be feasible, just an example).

One of the facility’s material suppliers delivers raw material to the facility daily. The deliveries must arrive by 10:00 a.m. each day so that the material handling team can receive the material and make it available to support the production schedule. Recently, the deliveries have been arriving later each day and these late deliveries are affecting production. What steps should be taken to solve the problem?
## Response Key and Record
### Problem Solving Training Questionnaire

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**Questionnaire Analysis**

1) Using the form above, compare the questionnaire responses to the desired responses above, apply the weighting as directed in the form, and record the points for each participant. (The form can be adjusted to the number of participants.)

2) Total the points for each participant.

3) Compare the totals for the questionnaires administered prior to the training and those administered after the training.
Focus Group Script and Record

This focus group session is a follow-up to the recent training evaluation questionnaire for the Problem Solving Training. Please keep in mind that the questionnaire and this session are intended to serve as an evaluation of the training, not the participants, and will be used solely for continuous improvement of the training.

Give an example of a problem solving activity that you and/or your team have been involved in and how you worked through the problem.

(Record comments and overall impression from group.)

Let’s walk through a brief problem solving exercise, pointing out the problem solving steps as we go. (Use simulation question from questionnaire.) Let’s begin with the first step, which is ______________?

(Facilitate the exercise, recording the steps as given by the group and the related comments/activities for each step. Keep the session organized around systematic problem solving steps.)

Focus Group Analysis

1) Conduct focus group sessions before and after the training.
2) Collect and review the above information.
3) Compare the results before to the results after the training. Was there a marked difference in how the participants responded?