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**STUDENT MOTIVATIONAL SKILL TRAINING PACKAGE:  
EVALUATION FOR AIR FORCE TECHNICAL TRAINING**

By

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**December 1982**

**Final Technical Paper**

Approved for public release; distribution unlimited.

**LABORATORY**

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ADA 123542

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Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER AFHRL-TP-82-31	2. GOVT ACCESSION NO. AD-A123542	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) STUDENT MOTIVATIONAL SKILL TRAINING PACKAGE: EVALUATION FOR AIR FORCE TECHNICAL TRAINING		5. TYPE OF REPORT & PERIOD COVERED Final
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Barbara L. McCombs Jacqueline L. Dobrovolny		8. CONTRACT OR GRANT NUMBER(s) MDA 903-79-C-1093
9. PERFORMING ORGANIZATION NAME AND ADDRESS McDonnell Douglas Astronautics Company P.O. Box 516 St. Louis, Missouri 63166		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 62205F 11210906
11. CONTROLLING OFFICE NAME AND ADDRESS HQ Air Force Human Resources Laboratory (AFSC) Brooks Air Force Base, Texas 78235		12. REPORT DATE December 1982
		13. NUMBER OF PAGES 98
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Logistics and Technical Training Division Technical Training Branch Air Force Human Resources Laboratory Lowry Air Force Base, Colorado 80230		15. SECURITY CLASS (of this report) Unclassified
		15.a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)  Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of this abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES This contract portion of this effort was funded by Defense Advanced Research Projects Agency.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
career exploration computer managed instruction effective communication goal setting implementation strategies	motivational skill training positive self-control strategies problem solving stress management values clarification	
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		
This technical paper summarizes the historical background of the Pre-Course Student Skill Training Project and describes results of the development and evaluation of the Student Motivational Skill Training Package in a selected Air Force technical training course: Precision Measurement Equipment (PME). The findings from an evaluation of this package indicate that it provided relevant pre-course skill training that was positively received by students,		

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Item 20 (Continued)

instructors, and training managers. Most students who completed the motivational skills training liked the package and reported it was helpful in both their coursework and their personal lives. These students also scored significantly higher than a control student group on tests at the end of PME blocks I and II, and they had significantly fewer failures than did the control student group on these block tests. These findings offer evidence of the feasibility of modifying students' pre-course skills and strategies such that motivation to perform well is enhanced. This paper discusses additional implications of these findings, suggests areas of future research, and concludes with recommendations for implementing the training package. ↗

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## SUMMARY

### Problem

Many students entering military technical training not only lack effective reading skills and cognitive learning strategies, but also demonstrate affective skill deficiencies of an attitudinal or motivational nature. Although some attention has been given to programs that remediate reading skills, cognitive learning strategies, and study skills, little attention has been given to instructional packages that can remediate those cognitive and affective strategies and skills related to trainee motivation. A validated training program could improve the military trainees' ability to positively adjust to the requirements of military technical training. It could also help students develop a variety of self-management, personal responsibility, and self-control strategies which can increase trainee motivation, efficiency, and effectiveness. Such improvements could possibly reduce the high costs associated with eliminating motivationally deficient trainees after they have completed sizeable portions of technical training. In addition, greater job satisfaction on the part of trainees receiving the motivational skills training could contribute to higher reenlistment rates.

### Purpose

This technical paper summarizes the historical background of the Pre-Course Student Skills Training Project and describes the development and

evaluation of a Student Motivational Skill Training Package in a selected Air Force technical training school. The report also discusses various implications of the findings, suggests areas of future research, and concludes with recommendations for implementing the skill training package.

### Approach

Data for the evaluation of the Student Motivational Skill Training Package were collected from first and second shift students in the Precision Measurement Equipment (PME) course at the Lowry Technical Training Center in Denver, Colorado. Experimental (second shift) and control (first shift) groups of students, along with a group of instructors responsible for experimental group students in the early blocks of their computer-managed technical training course served as subjects. The number of students available for evaluation analyses in each group ranged from 11 to 82.

Students in the experimental group received the Student Motivational Skill Training Package immediately prior to beginning the first block of the PME course. This training was conducted over a 5 day period, 5 hours per day, using the technical training instructors in the experimental group as trainers. Small groups of 10 to 15 experimental students received the self-instructional seven-module package, along with instructor-led group discussions. During the evaluation period, a total of seven groups of PME students were trained using the skill package. Students participating in

the training also took end-of-module tests which were scored by the computer-managed instruction (CMI) system of the Air Force Advanced Instructional System (AIS). Following training, students entered the first block of the PNE course, and comparisons with control group students began.

Measures used in the evaluation of the Student Motivational Skill Training Package included: (a) measures of students' knowledge of the concepts presented in the skill modules (end-of-module tests, pre/post skill training tests); (b) measures of student attitudes (end-of-module attitude tests) and opinions (anecdotal information from interviews and discussions) about the training package; and (c) PNE course performance measures (block test scores, block test failure rates). Instructor and course management personnel reactions to the package also provided a source of evaluation information. The AIS was used to collect pre/post skill training test and course performance information for both experimental and control group students.

### Findings

In the area of students' knowledge of concepts presented in the seven skill training modules, two measures were used. End-of module test results indicated that students participating in the training satisfactorily reached criterion on all tests. Results on the pretest and posttest, which covered all seven modules, generally indicated that, although the groups did not differ in pretest scores, experimental group students had higher scores on the total posttest and on the majority of module subscales than did control group students. These findings indicate that experimental group students successfully acquired the concepts presented in the Student Motivational Skill Training Package.

In the area of students' attitudes and opinions about the training package, students' initial attitudes at the end of the training experience and their subsequent attitudes after they were in their technical training course were highly positive. During the training sessions, students indicated that they liked the modules, found them useful, and were willing to exert at least moderate levels of effort to learn and apply the concepts and skills presented. After experimental group students were in their technical training course, they continued to react positively to the motivational skill training and expressed opinions that the modules gave them concepts that were helpful in their coursework, in getting ready for studying the course materials and taking tests, and in their personal lives.

The findings in the area of student course performance indicated that experimental group students had significantly higher block test scores and significantly lower block test failure rates than did control group students. These findings suggest that the Student Motivational Skill Training Package may impact variables related to student attrition from technical training (i.e., number of block test failures)--a suggestion that remains to be verified by subsequent research. In addition, comments from PME instructors and course management personnel indicated that experimental group students had lower absenteeism, more confidence about taking tests, and shorter lesson completion times than did control group students.

Additional anecdotal and qualitative information used in the evaluation of the student skill training package was obtained from discussions with instructors and supervisory personnel and a limited number of observations of student behavior in the learning center. From these sources it was learned that experimental group students were generally actively involved in learning their technical training materials, were not afraid to ask questions, and had visible positive relationships with their instructors and fellow students. Reactions of supervisory and management personnel to the Student Motivational Skill Training Package were particularly positive. They felt that the materials, format, concepts, and range of topics covered in the package were highly relevant. Supervisory and management personnel in the PME course have asked that the package be made available to all students in the course in the future.

## Discussion and Conclusions

The quantitative and qualitative findings in the evaluation of the Student Motivational Skill Training Package indicate that the package met its goal of providing relevant pre-course skill training. The materials were positively received and led to improvements in the performance of Air Force technical training students in the PME course. The findings also provide evidence of the feasibility of modifying individuals' pre-course skills and strategies such that motivation to perform well is enhanced.

The success of the package in a course which selects mainly high ability students with high motivation to succeed was beyond the initial expectations for this package. The package had been designed primarily for lower ability, less mature, and less motivated technical training students. The fact that it produced positive effects on the performance of the higher ability PME student suggests that this training package has far wider applicability to the needs of the technical training student than was originally envisioned. This wider applicability appears in large part to be due to a careful matching of skills and strategies to the developmental needs and age levels of the students, to the use of valid principles of instructional design, and to the use of a user-oriented implementation strategy. Any subsequent implementation of the package should use a similar implementation strategy. The implementation should include user inputs and decisions at each of seven stages in this semi-structured process, thereby facilitating user acceptance and transition of the training product to the operational environment.

## INTRODUCTION

### Definition of the Problem

The application of cognitive and affective learning strategies in the military has been an area of increasing concern since the termination of the draft in 1972. A prevalent and continuing military problem, predicted by Vitola and Valentine (1971a, 1971b), is that manpower resources from the higher aptitude levels have become more limited and the percentage of high school and college graduates is lower than found during the draft. Recent recruits have been found to possess inadequate basic reading skills (Duffy, 1977; Fletcher, 1977; HumRRO, 1977; Mockovak, 1974; Smith, 1980; Stolte & Smith, 1980), as well as deficiencies in those cognitive and affective skills associated with motivational problems (Jealous, Bialek, Pitpit, & Gordon, 1975; Joyce, 1980; McCombs & Dobrovoiny, in press; McCombs, Dobrovoiny, & Judd, 1979; O'Neil & Spielberger, 1979). The nature of the skill-deficient recruit's problem is likely to include, then, a lack of basic reading and cognitive skills coupled with motivational skill deficiencies.

There is some evidence that motivational problems experienced by young recruits may be of a developmental nature. Gade and Peterson (1977) discuss the fact that students at lower levels of ability--along with possessing poor decision-making and analytic skills--also exhibit low levels of vocational maturity and lack clear values and goals. One can also speculate that given the age of the average military trainee (between 17 and 20 years), many

trainees are experiencing conflicts typical of their developmental stage (between adolescence and adulthood). These conflicts may lead to affective skill deficiencies of an attitudinal or motivational nature and may contribute to the military trainee's inability to adapt to the requirements of military technical training. Thus, skill deficiencies in the military recruit population entering technical training may encompass skills in both the cognitive and affective domains. Learning strategies research and application in the military student population must address both these skill areas--a position in keeping with the argument that affect and cognition are inseparable yet distinct (Hurst, 1980; Piaget, 1952; Zajonc, 1980). Neither process domain should be neglected.

#### Project Background

Experience with the Air Force Advanced Instructional System (AIS) has indicated that many technical training students entering this computer-managed instructional (CMI) environment lack the basic conative (will to learn), affective, and cognitive skills required to motivate themselves effectively and perform well in their technical training courses. Our prior work for Defense Advanced Research Projects Agency (DARPA) in this area indicated that substantial payoffs in reduced training time can be achieved through self-instructional student training in time management and study skills. It was also learned that instructor involvement and support of such skill training is critical to its success. This earlier work, however, investigated only a small set of study and self-management skills essential to effective and efficient student performance in a self-directed technical training environment. The effort discussed in this current paper addresses additional student

skill training areas particularly tailored to the unique conative, affective, and cognitive skill deficiencies of those technical trainees in the lowest quartile on course performance measures. This effort has the potential of increasing training effectiveness through increasing trainee motivation and efficiency, avoiding the high costs associated with eliminating deficient trainees after they have completed sizeable portions of the training, and contributing to increased job satisfaction and thus to a higher reenlistment rate for trainees receiving the skill training.

### Goals of Project

This project addressed the problem of student deficiencies in pre-course conative, affective, and cognitive skills necessary for effective performance in a computer-based military technical training environment. The goals were: (1) to determine those types and characteristics of trainees most in need of individualized skill training; (2) to determine the scope and type of skill training likely to have the most payoff in the conative, affective, and cognitive skill domains; (3) to develop and evaluate skill training materials in the specific skills selected within each domain; and (4) to develop and evaluate an instructor orientation package to familiarize instructors with the purpose and procedures involved in each skill training area.

## Purpose of Report

This paper summarizes activities completed in the accomplishment of the preceding goals. The approach taken to the identification of specific cognitive, affective, and conative trainee deficiencies is described in the following section on Historical Background, along with use of this information to develop specialized skill training packages to remedy the deficiencies identified. The remaining sections of the report describe the approach taken for the evaluation of the skill training package, the results of this evaluation, and conclusions and recommendations based on the evaluation findings.

## HISTORICAL BACKGROUND

### Research Context

The context for this research program was the Air Force Advanced Instructional System (AIS). The AIS is a prototype, multimedia, computer-based instructional system designed to improve the effectiveness and efficiency of Air Force technical training and to provide an operational research facility for assessing innovations in instructional technology. During the period of this research, the system supported three technical training courses representative of many cognitive and performance skills required by enlisted Air Force personnel. Military trainees learned their respective course materials via self-paced, individualized, and computer-managed instruction (CMI).

The new learning requirements of a CMI training environment make the inadequacies of various cognitive and affective skills even more apparent (McCombs et. al., 1979). In a CMI environment, students are expected (a) to be attentive and motivated; (b) to make learning materials meaningful by the appropriate use of learning strategies and skills; (c) to practice personal responsibility and self-management skills required for self-directed and self-paced learning; (d) to interact effectively with both their peers and their instructors; and (e) to set appropriate course goals.

#### Definition of Student Skill Training Needs

Literature Review. During the first phase of this effort, an extensive literature review was conducted to identify student variables associated with academic under-achievement--variables suggestive of the kinds of students likely to experience learning or motivational difficulties in military technical training. Research in this area was reviewed from a variety of prevalent theoretical perspectives, including attribution theory, information processing theory, cognitive-behavioral orientations, and theories of human development.

First, those student variables which were consistently identified as being important to academic success across the theoretical orientations we reviewed included:

- (1) students' level of self-esteem or self-acceptance;
- (2) students' inherent interest in learning or intrinsic motivation;
- (3) the extent to which students have an integrated value system; and
- (4) the extent to which students accept personal responsibility for learning and for the events in their personal lives.

Across the four theoretical orientations reviewed, the importance of a student's ability to implement effective coping skills (e.g., assertiveness, stress management) and successfully adapt to and perform well in stressful situations was also emphasized.

Additional student variables identified as important to achievement motivation and performance from the perspective of attribution theory (Bartol, 1978; Covington & Omelich, 1979; Halperin & Abrams, 1978; Thomas, 1979; Weiner, 1979, 1980) included:

- (1) students' perceptions of their locus of responsibility for academic and personal successes and failures; and, concomitantly,
- (2) students' feelings about the amount of control they have over academic or life event outcomes, or the presence or absence of feelings of learned helplessness.

Other student variables identified from an information processing theory orientation (Bransford, Stein, Shelton, & Owens, 1980; Fransson, 1977; Mischel, 1979; Rogers, 1977; Sternberg, 1977a, 1977b, 1979; Williams, 1978; Wittrock, 1978, 1979, 1980; Wittrock & Lumsdaine, 1977) included:

- (1) students' ability to initiate effectively and spontaneously executive processes and strategies that can be applied to problem solving or comprehension tasks; and
- (2) students' ability to execute effectively skills for dealing with negative affect (e.g., test anxiety) while engaging in information processing activities.

The cognitive-behavioral framework (Bandura, Adams, & Beyer, 1977; Berman, 1978; Ellis, 1977; Kendall & Hollon, 1979; Mahoney, 1977; Meichenbaum, 1977; Meichenbaum & Asarow, 1979; Richardson, 1976; Woolfolk & Richardson, 1978) identified the importance of the following student variables:

- (1) the nature of students' self-verbalizations regarding themselves, their abilities, or instructional factors;
- (2) students' beliefs and expectations regarding learning situations and their ability to perform in these situations; and
- (3) students' ability to cope with stressful situations through the use of such things as assertiveness or stress management skills.

From the developmental perspective (Elkind, 1978; Erikson, 1968; Herrmann, Post, Wittmaier, & Elsasser, 1977; Korb & Pepin, 1979; Maslow, 1954; Tobacyk, 1978; White, 1966), additional variables identified as important to effective performance include:

- (1) students' level of intellectual, emotional, and vocational maturity;
- (2) students' commitment to meaningful academic and personal goals;
- (3) students' achievement of ego identity or personality integration;  
and
- (4) students' ability to cope with and adapt to task demands.

Of the variables identified in this review, some can be classified as conative, some as affective, and some as cognitive. In the conative class are variables associated with motivation to learn (i.e., students' inherent interest in learning or intrinsic motivation). In the affective class, students' self-esteem, values, goals, beliefs, expectations, attributions,

and coping skills were identified as important to intellectual, emotional, and vocational maturity, as well as to students' academic and personal responsibility. In the cognitive class, various executive processes, strategies, and skills were identified as important to effective academic or personal decision-making or problem-solving.

An examination of the types of student variables related to academic achievement reveals that variables in the conative, or motivation to learn, class directly or indirectly affect a student's effective use of processes and skills in both the affective and cognitive domains. Thus, as Covington and Omelich (1979) have argued, students need to see themselves as both able and motivated in order to perform well. In addition, Maehr (1980, p. 5) has stated, "Not only is the motivational factor potentially changeable, there are the beginnings of a technology that may be successfully applied to the real world of the school."

Examination of AIS Student Data. Two types of data analyses were completed in order to determine whether existing AIS preassessment measures could assist in defining the types of technical trainees in need of skill training in three AIS courses: the Inventory Management (IM) course, the Weapons Mechanic (WM) course, and the Precision Measuring Equipment (PME) course. The first type of data analysis was concerned with determining if cognitive and affective variables in each course's preassessment battery could reliably distinguish between those students performing efficiently and effectively, in terms of course completion time and cumulative performance scores, and those students performing inefficiently and ineffectively (i.e.,

whether these variables could differentiate the fastest/highest scoring 75 percent from the slowest/lowest scoring 25 percent of the students). The second type of data analysis was concerned with identifying preassessment variables that were sensitive to specific student skill deficiencies in the three skill domains (conative, affective, cognitive). The analysis procedure consisted of within-group (i.e., within the inefficient/ineffective group) multiple stepwise regressions, using training time and criterion-referenced test scores as criterion variables.

In general, the data analyses suggested that in the conative domain, unsatisfactorily performing students had low interest and motivation toward learning the course materials, and thus could possibly benefit from skill training in how to motivate themselves and develop attitudes of pride in doing their best. In the affective domain, the data indicated that students in the unsatisfactory groups experienced high anxiety toward the course and toward taking tests, and that these students could perhaps benefit from skill training in techniques for managing stress, anxiety, or feelings of tension, as well as from attribution retraining. In the cognitive domain, results indicated that unsatisfactory performance groups had poor logical reasoning, reading comprehension, and study skills and could possibly benefit from skill training in logical reasoning and problem solving techniques, as applied to both technical learning problems and personal problems. In addition, data showed that more females, younger students, and students with less educational experience were in the unsatisfactory performance groups; they might benefit from skill training to enhance maturity, personal responsibility, and effective communication.

Student and Instructor Interviews. Interviews with AIS students and instructors in the IM, WM, and PME courses were conducted: (1) to ascertain their perceptions of the characteristics which distinguish students performing well versus poorly; (2) to identify their perceptions of the problems students have with the course and their strategies for coping with these problems; and (3) to solicit suggestions on the types of skill training they felt would be most beneficial.

Results of these interviews indicated that the kind of students having the most difficulty in successfully completing their courses were those who exhibited the following characteristics:

- (1) In the conative domain, the poorer students consistently were those who had low motivation to learn, had few military or personal goals, and could be classified as being less mature, with little self-discipline and unable to take responsibility for their own learning.
- (2) In the affective domain, the poorer students were generally those who had high levels of anxiety about their ability to perform well in the course and to take tests, and who lacked effective skills for coping with the demands of technical training.
- (3) In the cognitive domain, the poorer students were generally those with poor reasoning and comprehension skills, or those who lacked problem solving skills in technical and/or personal areas.

Areas of skill training suggested by the interviews included:

- (1) In the conative domain, training in skills necessary to the development of personal and vocational maturity was suggested, along with training in skills necessary to establish and maintain motivation to learn (e.g., values clarification, career exploration, goal setting).
- (2) In the affective domain, suggested skill training areas included those designed to promote students' management of relevant sources of stress (e.g., test anxiety) and training in skills for achieving positive self-control in other types of stressful situations (e.g., effective communication skills).
- (3) In the cognitive domain, training in general systematic thinking and problem solving skills was suggested.

#### Development and Validation of Individual Difference Battery

Based on the results of the literature review, AIS student performance analyses, and instructor and student interviews, a set of individual difference measures was selected from available measures, or designed by the contractor where satisfactory measures did not exist. In general, the measures were designed to assess students' (a) personal values and goals; (b) emotional or psychological and vocational maturity; (c) self-concept or self-esteem; (d) expectations about the demands of the military, technical training, or responsibility for their own learning; (e) perceptions of their ability to deal with various sources of stress; (f) ability to make responsible decisions (be assertive); (g) achievement motivation or fear of failure;

(h) success/failure attributions; (i) learning-related self-verbalizations; and (j) problem solving or critical thinking skills.

The resulting battery of 140 items was validated to identify the smallest set of items which could (a) reliably discriminate satisfactory and unsatisfactory performance groups in two AIS courses (the IM and PME courses); and (b) define particular skill training strategies or treatments for those students performing unsatisfactorily. The conclusions were:

- (1) a reduced subset of 80 items formed 30 factors which are both reliable (internally consistent) and predictive measures of the kinds of trainees performing satisfactorily or unsatisfactorily in a CMI military technical training environment;
- (2) the resulting 30 factors form theoretically and conceptually meaningful constructs suggestive of possible trainee skill deficiencies and skill training needs in the areas selected; and
- (3) the validation process yielded a set of factors that can be further evaluated in terms of their predictive and diagnostic utility in assigning selected motivational skill training materials developed as part of this project.

#### Definition of Student Motivational Skill Training Package

As a first step in the definition of the student motivational skill

training modules developed in this project, literature related to treatment approaches and behavior maintenance approaches was reviewed. Potentially effective strategies and procedures for remedying skill deficiencies were identified.

Selective review of cognitive behavior modification approaches to treating skill deficiencies related to motivation to learn identified a number of approaches which have been successfully used to alter cognitions, feelings or performance. The most successful approaches were those that emphasized cognitive restructuring, the modification of dysfunctional self-talk, cognitive/behavioral modeling, and behavioral rehearsal (Block, 1978; Deffenbacher, Mathis, & Michaels, 1979; Deffenbacher & Parks, 1979; Deffenbacher & Shelton, 1978; Ellis, 1977; Galassi & Galassi, 1978; Goldfried & Davison, 1976; Goldfried, Linehan, & Smith, 1978; Lange & Jakubowski, 1976; Mahoney, 1977; Mahoney, Moore, Wade, & Maura, 1973; Meichenbaum, 1972, 1975, 1977; Meichenbaum & Goodman, 1971; Mischel, 1979; O'Neil & Richardson, 1978; Rathus, 1973; Richardson, 1976; Snyder & Deffenbacher, 1977; Vorweg, 1977; Wolfe & Fodor, 1977; Woolfolk & Richardson, 1978). These approaches were successful in such areas as (a) promoting self-identity and helping people feel better about themselves; (b) increasing people's perceptions of the amount of control they have over situations or events and their feelings of responsible self-control; (c) helping people acquire strategies for successfully coping with stress in a variety of situations; and (d) assisting people to assert themselves more effectively and achieve desired goals.

The review of cognitive behavior modification approaches to skill maintenance following initial training or treatment indicated that techniques which have been successfully used include various combinations of self-monitoring/self-assessment with self-reinforcement (Carter-Haar, 1978; Greiner & Karoly, 1976; R. Hart, 1978; Highlen & Voight, 1978; Judd, McCombs, & Dobrovolny, 1979; Kirschenbaum & Karoly, 1977; Komaki & Dore-Doyce, 1978; Krumboltz & Shapiro, 1979; Myers, 1978, O'Neil & Richardson, 1978; Rathus, 1973; Richards, McReynolds, Holt, & Sexton, 1976; Richardson, 1976; Sagotsky, Patterson, & Lepper, 1978; Woolfolk & Richardson, 1978; Ziesat, Rosenthal, & White, 1978). The techniques used in self-monitoring include personal diaries, journals, logs, note cards, graphs, progress charts, and other record keeping procedures that require individuals to frequently evaluate and record positive and negative instances of the skills and behaviors in question. In addition, goal setting has been found to be effective in enhancing individuals' motivation to monitor and assess their behavior or psychological processes. Self-reinforcement techniques include engaging in positive self-talk when desired outcomes are attained, recording self-ratings on the effectiveness of their skills, and identifying and applying extrinsic rewards when certain skills and behaviors have been successfully implemented.

An integration of these findings with the results of analyses of trainee skill deficiencies in the AIS context resulted in the identification of seven skill training modules to be included as part of the Student Motivational Skill Training Package. These modules are: Introduction, Career Exploration, Values Clarification, Goal Setting, Effective Communication, Stress

Management, and Problem Solving. These modules were designed specifically for those students performing unsatisfactorily in the three AIS courses. The seven modules are individually packaged in a self-instructional printed format which makes extensive use of visual organizers, embedded questions, practice exercises, and a variety of the treatment and skill maintenance approaches identified in the preceding literature review. In addition, an instructor orientation and training package is included as part of this total program, now given the general title of "Motivational Strategies for Positive Self-Control and Development." The following sections provide a brief description of each of the seven modules in the student package, and the instructor orientation and training package.

Introduction Module. A substantial body of research has shown that various types of advance organizers can significantly improve a reader's ability to integrate and comprehend information (e.g., Felker & Dapra, 1975; Kaplan & Simmons, 1974; Mayer, 1975, 1979; Wittrock, 1978, 1980). For the student package, then, an introductory module which details the objectives and general perspectives of the skill training was designed. Information which was felt to be important for students to understand as part of taking positive self-control and personal responsibility for their own learning and lives included Maslow's hierarchy of needs, the self-fulfilling prophecy and the use of self-talk and imagination in gaining positive attitudes and behaviors, being their own coach, practicing imagination, and the steps involved in controlling or changing negative attitudes and beliefs.

Values Clarification Module. The purpose of values clarification, according to G. Hart (1978), is educational and such training is usually designed to help individuals identify important values in their lives and to explore how their various values combine into a value system. Students are given a number of exercises to help them analyze what is important to them in the following areas: Other people and values; leisure time and values; personal traits and values; religion, race, and values; sex, marriage, children, and values; values as goals for life; clothes and values; and sharing their values with others.

Career Exploration Module. Research within the vocational or career development field reveals three important findings relative to this type of training. First, deficiencies in vocational maturity can be ameliorated in a short amount of time and in so doing, individuals often increase their motivation (Egner & Jackson, 1978; Galassi & Lemmon, 1978; Hamdani, 1977; Stephenson & Hunt, 1977). Second, the most successful training programs in this area often combine information about occupations with some type of interest and values clarification exercises (Connors & Pruitt, 1978; Egner & Jackson, 1978; Hamdani, 1977; Rayman & Bowsbey, 1977; Tichenor, 1977). Third, several successful programs have shown that increases in vocational maturity are retained over time (Galassi & Lemmon, 1978; Hamdani, 1977). Thus, this module was developed to provide students with information on how interests are related to careers and how to identify careers they may want to pursue on the basis of completing Holland's Self-Directed Search (Holland, 1974). The module also helps students use a decision making model in making

career decisions. Other important concepts presented in the module include (a) the difference between a good decision and a good outcome; (b) the influence of parents on career decisions; (c) the importance of hobbies and leisure activities in making career decisions; (d) the use of the Guide for Occupational Exploration and the Dictionary of Occupational Titles to complement information learned about their career interests from Holland's Self-Directed Search; (e) how to evaluate risks and costs; (f) how to make realistic plans; and (g) the use of imagination and positive self-talk in making career decisions and plans.

Goal Setting Module. Teaching students how to set goals helps them develop self-motivation skills and skills for monitoring and maintaining newly acquired self-management skills. Rosswork's (1977) research in this area seems to indicate that goal setting is an effective maintenance strategy due to the fact that if goals are consciously accepted, they maintain behavior at a given level regardless of incentive manipulations. The purpose of goals as directing and motivating human behavior is presented in this module, along with the following concepts in a systematic approach to setting goals: (a) the skill of questioning; (b) the use of imagination and self-talk in setting goals; (c) the technique of brainstorming; (d) the criteria for effective goal statements; (e) the importance of preliminary activities in setting goals; (f) the importance of contracts in setting goals; and (g) the importance of evaluation in setting and achieving goals.

Stress Management Module. Dr. Roy W. Menninger, president of the Menninger Foundation, has noted that some stress is "absolutely vital" to people's lives and that the problem is not to do away with stress but to "manage its excesses" (Menninger, 1980). Other researchers (e.g., McCombs-Leherissey, 1972; Sieber, O'Neil, & Tobias, 1977; Spielberger, 1966, 1975) have noted that stress in moderate amounts can be facilitative and improve an individual's task performance, whereas in larger amounts stress becomes debilitating and detrimental to task performance. This curvilinear relationship appears to hold up regardless of whether one is dealing with physical/motor tasks or with cognitive tasks (Spielberger, 1975). The purpose of the Stress Management module is to explain how stress operates in their lives, identify the major sources of stress, and present a variety of strategies for effectively managing excessive stress. The important concepts in this module include: (1) a definition of stress; (2) an explanation of the perceptual basis of stress; (3) the difference between good and bad stress; (4) the importance of mistaken beliefs in precipitating stress; (5) the Do, Think, Say method for managing stress; (6) ineffective methods for handling stress; and (7) the importance of using some type of skill maintenance strategy to insure that stress management skills become a permanent part of the students' behavior.

Effective Communication Module. Effective assertive communication is being able to communicate one's opinions, thoughts, needs, and feelings in a direct, honest, and appropriate manner (Lange & Jakubowski, 1976). It includes being able to distinguish assertiveness from both nonassertiveness and aggressiveness. The purpose of the Effective Communication module is to

provide students with another technique to help them achieve their goals and manage stress caused by interpersonal situations. The important concepts of this module include: (1) the definition of effective communication; (2) the difference between assertive, nonassertive, and aggressive styles of communication; (3) reasons for acting nonassertively and aggressively; (4) 10 basic rights that all people have and the mistaken beliefs that people have about these rights; (5) the use of "you" messages versus "I" messages; (6) effective listening skills; (7) changing ineffective communication skills to effective ones; and (8) the use of a variety of strategies for maintaining effective communication skills.

Problem Solving Module. Robert Sternberg (1977a, 1977b) hypothesizes that there are two levels of information processing. The first is the level of "components" that underlie intelligence--the steps, conscious or unconscious, that one goes through when one actually solves a complex intellectual task. The second is the level of "metacomponents" or higher order executive processes--the steps that one goes through when one decides how to solve an intellectual problem. It is, moreover, these metacomponents which many researchers, including Sternberg, believe differentiate high ability students from low ability students. In other words, the most important part of problem solving is structuring the problem, rather than performing the operations for arriving at an answer that is dictated by the structure of the problem. This module, therefore, was designed to describe a general problem solving process for helping students systematically think problems through and structure them in definable and solvable ways. The module also provides a

summary of the Student Motivational Skill Training Package in terms of providing possible solutions to the problem of poor student performance in technical training. The important concepts presented in this module include: (1) the steps in the problem solving process; (2) the difference between, and the futility of, retreating from or denying problems; (3) the importance of incubation in solving problems; and (4) how the developmental tasks of the target population--namely, military technical training students--can be successfully achieved by learning the skills presented in this program.

## APPROACH

### Rationale for Data and Procedures Used in Evaluation

Evaluation Measures. The goal of the evaluation of the Student Motivational Skill Training Package was to measure its impact on student performance in a CMI military technical training environment. The variables selected as indicative of student performance were (a) end-of-block criterion test scores (a block is a unit of instruction composed of from 5 to 50 lessons), and (b) failure rate per block (number of students who failed specific block tests on the first attempt). Although it would have been desirable to examine training time data, factors affecting the reliability of this information during the evaluation period prohibited use of these data. In addition, the length of time for the evaluation period allowed for collection of reliable course performance information in only the first two blocks of the course, making comparisons of course eliminations impossible.

Two other sets of measures were used in the evaluation of the skill training: end-of-module tests and pre/post skill training tests. Both sets of measures were designed to assess the degree to which students in the experimental group learned the major concepts presented in the training package. In the case of the pre/post tests, these measures were also used to assess changes in knowledge level for the experimental students relative to the control students.

It would also have been desirable to measure changes or improvements in the actual skills addressed by the Student Motivational Skills Training Package. Directly measuring changes in the skills addressed by a particular learning strategies/skill training package--whether these be cognitive, affective, or conative skills--is a difficult task at best. Although it is possible to analyze and define the underlying processes and skills necessary in such areas as values clarification, career exploration, goal setting, effective communication, stress management, or problem solving, such an effort was beyond the scope of this contracted research program. Students' ability to successfully complete various segments of the military technical training course was, therefore, considered the most important criterion of the success of the training package in this context.

Data Collection Procedures. Because of the contractor's location at Lowry AFB (the site of the AIS) data collection and analysis activities were accomplished directly by the contractor or the computer, with a minimum of school personnel support. In addition, anecdotal data were collected in the form of instructor comments and written student critiques of the training package.

Experimental Design and Procedures. The experimental design selected for the evaluation study was a matched control group design, wherein the group of second-shift instructors and students selected for training in the use of the Student Motivational Skill Training Package were matched with a group of control instructors and students from the first shift. Both experimental and control instructors were those who were responsible for lower blocks in the PME course, i.e., Blocks 1 through 6. The first shift control group of students received their technical training via the AIS in the PME course from 6 a.m. until noon, Monday through Friday. The second shift experimental group of students received their technical training via the AIS in the PME course from noon until 6 p.m., Monday through Friday.

The selection of shifts and the selection of instructors and students for the experimental and control groups was left up to school supervisory personnel. These personnel made their choices on the basis of manning requirements, instructor leave requests, instructor tour lengths, availability of student carrels in the first block of the course, and other variables important for school operation and for insuring comparability in experimental and control groups. School supervisory personnel also made an attempt to restrict the number of students who had prior service experience from participation in the Student Motivational Skill Training Package, as the training program was designed mainly for younger students with no prior service experience. In some cases, however, students with prior experience were assigned the training either because they requested it or because school supervisory personnel determined that they could benefit from such training.

Training of students in the use of the Student Motivational Skill Training Package was accomplished by technical training instructors. Bringing in outside trainers was seen as creating an artificial situation which could compromise the generalizability of the evaluation findings, and would also limit the amount of assistance students could be given in applying skills learned while in the technical training environment.

The Inventory Management (IM) course was originally scheduled to be the second course involved in the summative evaluation of the student skill training package. Because of instructor manning shortages, however, this course had to be withdrawn from the evaluation study. Given that the PME course was at this time the only other testbed available, it became the evaluation site for both this study and another research project being conducted by the contractor. This other project was entitled the CMI Instructor Role Training Program, a project jointly funded by the Navy Personnel Research and Development Center (NPRDC) and DARPA. The CMI Instructor Role Training project involved having instructors complete a 12-module training course on the roles and responsibilities of CMI instructors, and it was decided that the incorporation of the Student Motivational Skill Training Package as part of instructor training in their learning facilitator roles would efficiently accomplish instructor orientation and training requirements for this project. This procedure necessarily confounds evaluation results, however, and makes it impossible to separate effects due to the instructor versus student skill training materials. In discussing the findings, however, every effort will be made to discuss the potential impact of the individual programs where appropriate.

## General Procedures

The evaluation of the Student Motivational Skill Training Package was conducted in two parts: a formative evaluation and a summative evaluation. The purpose of the formative evaluation was to obtain suggestions, critiques, and comments from potential users of the materials and to provide the users with an avenue for constructive and significant input into the training materials. The purpose was also to obtain feedback on the extent to which the materials achieved the goals they were designed to meet, in a clear and non-confusing manner. Formative evaluation was conducted with instructors and students from the IM course. The procedures for this evaluation were informal: the contractor attended a staff meeting, explained the program, and then asked for individuals to volunteer to critique the materials and to give a module to one of their students for critique. The first module, the *Introduction*, was then handed out to the instructor volunteers. One week later the contractor returned, picked up the first set of module critiques, and distributed the second module. This procedure continued until all but the Problem Solving module had been critiqued. Due to scheduling and instructor manning problems, the Problem Solving module was subjected only to an in-house review by contractor personnel assisting in this effort. As a result of this formative evaluation, the following changes were made: (a) a glossary of key words was added to the back of each module; (b) several of the modules were expanded, revised, and clarified; (c) numerous diagrams, graphics, and charts were added, revised, or clarified; and (d) some of the worksheets and other maintenance strategies were modified or revised.

The primary purpose of the summative evaluation was to measure the effectiveness of the Student Motivational Skill Training Package in terms of improvements in student performance. The first step in this evaluation was to train the trainers--the PME lower block military technical training instructors from the experimental group. (See the section entitled Training Procedures, beginning on page 27, for a description of this training.) Once the instructor training was completed, a schedule was established by PME school supervisory personnel such that every instructor would have an opportunity to be responsible for one training class of students. These training classes contained between 10 and 15 technical training students just beginning the PME course, with each class lasting approximately 6 hours per day for 4 to 5 days.

### Measures

During the skill training portion of the summative evaluation, two sets of measures were used to evaluate students' knowledge of concepts presented in the skill modules. The first set of measures was the end-of-module tests which students took after reading each of the seven modules in the training package. Each of these module tests consisted of five multiple-choice cognitive items and three multiple-choice, scalar response affective items. The cognitive items were designed to measure the students' knowledge of the concepts presented in the module and the affective items were designed to measure the students' overall impression of each module and their opinions about the readability and utility of each module. (Copies of the seven module tests can be found in Appendix A.)

The second set of measures used to assess success of the training modules in helping students acquire new knowledge about major concepts in the package was the pre/post skill training tests (see Appendix B). Each of these tests consisted of 14 multiple-choice items, with two items covering the concepts of each module and with the order scrambled between the pretest and the posttest. These tests were scored as a total score and as seven subscales--one for each of the seven modules. The pretest was administered to experimental students prior to their beginning the skill training package, and to the control group students before beginning the first block of the course. (The experimental students went into the first block of the course following their 5-day skill training period.) The posttest was administered to both experimental and control students at the beginning of the second block of the course. As such, the posttest served as a measure of the experimental students' retention of knowledge taught in the skill training package, and served as a measure of difference in knowledge between experimental and control students. In addition to these knowledge measures, data of an anecdotal nature were collected in the form of instructor comments and written student critiques.

Following the skill training sessions, the effectiveness of the training package was assessed by a number of student PME course performance measures. These were blocks I and II test scores and failure rates. Failure rate is defined as the number of times students fail each block test. (Note: Block times were not included as a performance measure.)

## Training Procedures

The format for this training program was CMI: Instructor-trainees and students read the materials at their own pace and took tests over these materials when they were ready to be evaluated. The CMI system graded each of their tests and gave them their next assignment. Periodic group discussions were held to give instructor-trainees and students the opportunity to practice new skills, share strategies and techniques for implementing these skills, discuss problems and solutions, and share similar frustrations and successes.

The contract investigators served as the group leaders for the instructor training course, and these instructors then served as group leaders for the student skill training. The role of the group leader was defined as one of facilitator and counselor, and thus techniques for active listening and clarifying were stressed. When reviewing the exercises described in the materials during the group sessions, the group leaders encouraged subjects to learn from one another. There were no right or wrong answers, so it was important for the subjects to learn alternative solutions, approaches, or techniques.

The modules in the CMI Instructor Role Training Program are: Module 1: The Role of the Instructor in CMI; Module 2: Preparing to be a CMI Instructor; Module 3: Understanding the Technical Training Student; Module 4: The Instructor as a Learning Manager--Planning the Environment; Module 5: The

Instructor as a Learning Manager--Planning Instructional Events; Module 6: The Instructor as an Implementor of CMI Plans; Module 7: The Instructor as an Evaluator; Module 8: The Instructor as a Diagnostician; Module 9: The Instructor as a Remediator; Module 10: The Instructor as a Counselor and Career Advisor; Module 11: The Instructor as a Modeler; and Module 12: Coordinating CMI Instructor Roles--Putting It All Together. The group discussions covering these modules focused on the major concepts, principles, and strategies presented in each module and gave subjects an opportunity to share their experiences in these areas.

After the contract investigators trained the technical training instructors, the instructors were encouraged to follow a similar training format for the Student Motivational Skill Training Package, taking up to 5 days for this training and incorporating their own ideas and procedures in group discussions as they saw fit. One of the instructors volunteered to be the first Senior Instructor for the student training. A Junior Instructor was then chosen from among the trained instructors by the second shift supervisor. These two instructors then conducted the first class of student training. For the second week of student training, the Junior Instructor from the first week became the Senior Instructor and another trained instructor was chosen to be the Junior Instructor this week. This procedure continued each week with a new Junior Instructor being chosen by the supervisor and the old Junior Instructor becoming the Senior Instructor. Contract investigators met with Senior and Junior Instructors each week of the student training period to answer questions and discuss the effectiveness of various innovations implemented by the instructors.

## Data Collection and Analysis Procedures

All of the performance measures were administered and the data collected by the AIS. The AIS also provided data analysis capabilities, including the use of the Statistical Program for Social Sciences (SPSS) in evaluation analyses.

## RESULTS

Results of the evaluation analyses are presented in three categories pertaining to students' (1) knowledge of concepts presented in the skill modules; (2) attitudes and opinions about the training package; and (3) course performance following the skill training. Analysis procedures and findings in these areas are presented in the following sections. In addition, anecdotal information obtained from discussions with instructors and supervisory personnel, and from limited observations of students in the learning centers, is reported.

### Student Knowledge of Concepts in Skill Modules

The degree to which students learned the concepts presented in the Student Motivational Skill Training Package was assessed by end-of-module knowledge tests and pre/post skill training knowledge tests. The results for these two sets of measures are presented in the following sections.

End-of-Module Knowledge Tests. The module tests taken by students at the end of each of the seven modules contained five cognitive items and three attitude items. Students took this test only once and were required to achieve a criterion of 4 out of 5 (80 percent) on the cognitive items. For students who did not reach this criterion, instructions were given that they review items missed with their training leader before going on to the next module.

Test item analysis results maintained and reported by the AIS were available for all 82 students who completed the package. The average cognitive test scores per module and percentage of students passing each module on the first attempt are reported in Table 1. The majority of students answered the cognitive items correctly and passed each module's criterion test on the first attempt.

Pre/Post Skill Training Knowledge Tests. Pre/post skill training tests were administered to PME students in the experimental and control groups as described in the Measures section on pages 25 and 26. An error in the variable definition procedures invalidated data collected on the Career Exploration module subscale for both the pretest and posttest measures. The means for all other module subscales and the total scores on each test for both groups are reported in Table 2. Results indicated that (1) students in the experimental and control groups did not differ significantly on any of the module subscales or total scale for the pretest measure; (2) students in the experimental group obtained significantly higher scores on the total

TABLE 1  
 End-Of-Module Knowledge Test  
 Performance for Experimental Group (n=82)

Variable	Test Scores*		Percent Reaching Criterion on First Attempt
	$\bar{X}$	SD	
Module 1	4.29	1.26	85.8%
Module 2	4.13	1.64	82.0%
Module 3	4.33	1.08	86.0%
Module 4	4.29	.94	85.8%
Module 5	4.28	1.18	85.4%
Module 6	4.29	.99	85.8%
Module 7	4.04	.92	80.4%

\*Results for the sum of five cognitive items, where maximum possible score is 5.

posttest [ $t(1,32)=-2.53$ ,  $p < .02$ ], on the Introduction module subscale [ $t(1,32)=-2.25$ ,  $p < .04$ ]; and on the Effective Communication module subscale [ $t(1,32)=-2.18$ ,  $p < .04$ ]; and (3) differences between experimental and control group students approached significance on the Goal Setting module subscale [ $t(1,32)=-1.68$ ,  $p < .11$ ] and on the Problem Solving module subscale [ $t(1,32)=-1.93$ ,  $p < .07$ ].

Thus, experimental students had higher knowledge scores than control group students on all but two of the modules available for analysis--the Values Clarification module and the Stress Management module. Experimental students did achieve somewhat higher mean scores than did control group students on these two modules, although these differences did not approach significance.

#### Student Attitudes and Opinions About Skill Training Package

How students in the experimental group felt about the Student Motivational Skill Training Package was assessed by (a) end-of-module attitude test scores and (b) written student critiques completed at the end of the skill training period. Results in both areas are reported below.

End-of-Module Attitude Tests. The three attitude items on the end-of-module tests for the seven student modules asked students (1) if they liked the module, (2) if they felt the information was useful to them, and (3) to indicate the level of effort they would exert for the module. These data are summarized in Table 3, in terms of the percentage of students choosing

TABLE 2

## Pre/Post Skill Training Knowledge Test Results

Variable	$\bar{X}$	Experimental SD	n	$\bar{X}$	Control SD	n
<u>Pretest</u>						
Introduction Module	.75	.63	40	.71	.65	38
Values Module	3.38	1.10	40	3.53	.98	38
Goal Setting Module	3.48	.55	40	3.34	.63	38
Communication Module	.95	.45	40	1.03	.28	38
Stress Module	1.43	.55	40	1.32	.62	38
Problem Solving Module	3.53	.68	40	3.55	.60	38
TOTAL	16.50	2.73	40	17.00	2.35	38
<u>Posttest</u>						
Introduction Module	1.57	.51	23	1.09	.70	11
Values Module	4.13	.87	23	3.90	.70	11
Goal Setting Module	3.48	.59	23	3.09	.70	11
Communication Module	1.61	.58	23	1.18	.41	11
Stress Module	1.78	.42	23	1.64	.51	11
Problem Solving Module	3.74	.45	23	3.36	.67	11
TOTAL	19.78	1.91	23	18.09	1.64	11

each response category for each item per module. (NOTE: For the first two items, responses in the two categories on either side of moderate were grouped into high or low.) In general, Table 3 indicates that the majority of PME students participating in the skill training liked the modules, found them useful, and were willing to exert at least moderate levels of effort to learn and apply the concepts and skills presented. The following general rank order of modules indicates how well liked and useful students felt they were: (1) Introduction module, (2) Effective Communication module, (3) Stress Management module, (4) Goal Setting module, (5) Problem Solving module, (6) Values Clarification module, and (7) Career Exploration module.

Student Critiques. A total of 66 of the 82 students who participated completed written critiques of their experience with the package. These were open-ended forms wherein students stated their opinions about the package in a short essay. Opinions and comments from these critiques were categorized into five areas (Quality of the Materials, Opinion of the Classroom Training Procedures and Experiences, Effect of the Training Package, Quality of Instructors Facilitating Skill Training, Suggested Changes in Student Skills Package) and a variety of specific opinions or comments per category were listed. Table 4 summarizes these data and shows the number of students who expressed each listed opinion or comment about the skill training. These results generally indicate that students (a) found the modules well-written and easy to read and understand, but some felt the materials were too simple and basic or repetitive and boring; (b) felt the classroom training procedures were good and provided an enlightening, enriching, informative,

TABLE 3

PME Student End-of-Module Attitudes Toward Each Module (n=82)

STUDENT SKILL MODULES	RESPONSE CATEGORY			
	HI	MED	LO	NO RESPONSE
<b>Introduction Module</b>				
Liked	82%	10%	1%	7%
Useful	82%	10%	2%	6%
Level of Effort	51%	35%	7%	7%
<b>Values Module</b>				
Liked	66%	20%	10%	4%
Useful	71%	16%	9%	4%
Level of Effort	45%	41%	10%	4%
<b>Career Module</b>				
Liked	64%	27%	6%	3%
Useful	71%	22%	3%	4%
Level of Effort	39%	43%	15%	3%
<b>Goal Setting Module</b>				
Liked	73%	18%	7%	2%
Useful	73%	21%	5%	1%
Level of Effort	40%	43%	15%	2%
<b>Stress Module</b>				
Liked	81%	15%	0%	4%
Useful	82%	13%	0%	5%
Level of Effort	43%	46%	6%	5%
<b>Communication Module</b>				
Liked	82%	13%	1%	4%
Useful	82%	15%	0%	3%
Level of Effort	48%	45%	5%	2%
<b>Problem Solving Module</b>				
Liked	69%	22%	7%	2%
Useful	69%	22%	6%	3%
Level of Effort	32%	50%	15%	3%

interesting, useful, and realistic experience; (c) felt the training package would have a helpful effect in their personal lives and would prepare them for the technical training environment, as well as help them look at themselves from a different point of view; (d) rated their instructors as good, helpful, and well-informed; (e) felt the training package should be mandatory for all technical training students; and (f) felt a shortened or more condensed version of the package might be better, particularly for older and more experienced students.

In summary, the attitude findings generally indicate that students liked the training package and felt the training concepts and experience would be helpful in both their personal lives and in their technical training experience.

#### Student Course Performance

The impact of the Student Motivational Skill Training Package on students' subsequent performance in the PME courses was assessed by measures of students' block test scores and number of attempts on the block test. These data for Blocks 1 and 2 are presented in Table 5 for experimental and control group students. (The number of cases available in subsequent blocks of the PME course was too small for reliable analysis.)

Block Score Results. The block score data reported in Table 5 were analyzed by the SPSS t-test program to determine significant differences between experimental and control groups. The analyses indicated that

TABLE 4

PME Student Opinions of and Comments About  
the Student Motivational Skill Training Package

Comments Within Opinion Category	Frequency*
<u>Quality of the materials</u>	
1. Modules are easy to read and understand; well written	11
2. Too simple; basic	6
3. Some materials were repetitive; boring	4
4. Comprehensive	1
5. Need more examples	1
6. Some information was contradictory	1
7. Some exercises were too difficult; they "dug too deep"	1
<u>Opinion of Classroom Training Procedures and Experiences</u>	
1. Interesting class, enlightening, enriching, informative	22
2. Good class	13
3. Useful and realistic class	4
4. If taken seriously, it would be a better class	4
5. Some of the information I have already learned	3
6. Moderately useful	3
7. Liked the group discussions	1
8. Name of course should be "Get To Know You"	1
9. Well organized class	1
10. Waste of time	1
<u>Effect of Training Package</u>	
1. Helpful in my personal life	12
2. Helps students prepare for the technical training environment	12
3. Helped me look at self from a different point of view, understand myself and straighten out some confusions	9
4. Gave me new ideas	3
5. Helps me learn how to improve myself	1
6. Helped me learn how to motivate myself	1
7. Helped me to adjust to life away from home	1
8. Helped me improve my attitudes	1
9. Caused stress by too many self-evaluations	1

TABLE 4 (Continued)

Comments Within Opinion Category	Frequency*
<u>Quality of Instructors Facilitating Skill Training</u>	
1. Good	27
2. Helpful	8
3. Well informed	4
<u>Suggested Changes in Student Skills Package</u>	
1. Should be mandatory for all technical training students	16
2. Should be condensed; shortened	4
3. People with prior service don't need this training; especially NCOs	3
4. Belongs in the high schools	3
5. Expand; more in depth; allow more time so students can complete all of the exercises	3
6. Add some audio-visuals	2
7. Class should be debating class rather than discussion class	1
8. More communication between students and instructors would be better	1
9. More group discussions	1
10. Make exercises more specific	1
11. Different room needed	1
12. Should be given only to poor students	1

\* Frequency, as it is used here, refers to the number of students who gave the specific comments or opinions listed above.

experimental students obtained significantly higher block test scores in both Block 1 [ $t(1,78)=-2.05, p < .05$ ] and Block 2 [ $t(1,46)=-2.12, p < .05$ ].

Number of Block Test Attempts. As shown in Table 5, experimental group students had significantly fewer block test attempts in Block 1 than did students in the control group [ $t(1,79)=2.29, p < .03$ ]. Although experimental students also had fewer block test attempts in Block 2, these results did not approach significance.

The lower part of Table 5 shows the actual number of failures on the Block 1 and 2 tests for experimental and control group students. This comparison shows a dramatically lower number of block test failures for experimental group students compared to control group students (i.e., 4.3% versus 18.6%). The course performance results, then, indicate that the Student Motivational Skill Training Package, combined with the instructor training component, had an effect on improving block test scores and reducing the number of block test failures in the first two blocks of the PME course.

#### Anecdotal and Observational Results

Several sources of anecdotal and observational information were available in the evaluation of the Student Motivational Skill Training Package. These included: instructor comments about the training package, supervisor and management personnel comments and reactions to the package, and information obtained from observing students in the CMI learning centers. Results are described in the following sections.

TABLE 5

Air Force PME Student Course Performance Means  
for Experimental and Control Groups

Variable	PME					
	Experimental			Control		
	$\bar{X}$	SD	n	$\bar{X}$	SD	n
Block 1 Score	85.00	9.06	38	79.46	14.21	41
Block 2 Score	88.60	7.97	30	83.00	10.25	18
Block 1 Attempts	1.05	.32	40	1.24	.44	41
Block 2 Attempts	1.00	.00	30	1.06	.24	18
Number of Failures (across Blocks 1 and 2)		3/70 (4.3%)			11/59 (18.6%)	

Instructor Comments. Comments on the training package were obtained from instructors in scheduled discussion times held with instructors responsible for the administration of the Package. The purpose of these discussions was to answer any questions about the package, to assist with any problems that arose in the training, or to offer suggestions on particular approaches, etc. During the evaluation period, a total of seven instructor discussion sessions were held.

PME instructors' comments during these sessions were categorized into three areas: Opinions about the Skill Training Class, Perceptions about the Effects of the Skill Training, and Suggestions for Changes in the Skill Training Procedures. In the first area, instructors reported that they had no difficulties in facilitating students' acquisition of the concepts and skills presented in the training modules. They did indicate, however, that they sometimes had difficulty encouraging students to participate in the group discussions and that it took some period of time for students to relax enough to share experiences in the group sessions. Instructors also indicated that the modules that seemed to be best received by the students were the Stress Management, Effective Communication, and Career Exploration modules.

In terms of instructors' perceptions of the effects of the motivational skill training, instructors generally reported that (1) absenteeism was down for experimental group students; (2) students were able to use the self-paced and computer managed format of the skill training as a way to prepare for the demands of this format in their technical training experience and that

it helped them build confidence for taking tests; (3) the feeling of "group" that developed as a result of the skill training experience helped students have more positive relationships with their peers and their instructors; and (4) students were told that they were in a special group and this made them feel and act special in their technical training experience.

Changes to the skill training which instructors suggested included (1) developing hypothetical situations which students could use as a format for practicing problem solving skills in small group sessions; (b) using visuals to present an outline of the major concepts in each module; (c) having students use some method of marking concepts that were particularly important or relevant for them (e.g., "dog-earring" pages); (d) having instructors become more involved in the actual teaching of the skills and strategies and in planning the group discussions; and (e) having more frequent group discussions.

Supervisor and Management Personnel Comments and Reactions. During the course of the evaluation, comments on the Package were made by PME supervisory personnel responsible for the second shift and civilian personnel responsible for curriculum development. These comments can generally be summarized as follows: (1) the materials format, concepts, and range of topics covered were felt to be highly relevant and covered needed areas for technical training students; (2) the length of the training package, including group discussions, was felt to be appropriate and feasible for implementation; and (3) tangible effects of the training in terms of higher student motivation, shorter completion times, higher test scores, and fewer failures had been observed in

comparisons of experimental versus control group students. Supervisory and management personnel felt so positively about the package, and its potential impact on student performance and attrition, that they asked if copies of the student skill modules could be made available for implementation with all PME students in the near future.

#### Student Comments

Student comments about the benefits of the training package were that it (1) presented concepts that were useful to their coursework, particularly in the Stress Management, Goal Setting, and Problem Solving modules; (2) helped them get ready for studying the course materials and for taking tests; (3) would be most helpful for students who are less mature, less motivated, and of lower ability; (4) should be implemented as part of Basic Training for all students; and (5) should be taught by highly qualified instructors who understand the concepts and strategies in the package.

In summary, these anecdotal and observational data generally indicated favorable student reactions to the training package and its benefits to them in technical training and beyond, positive instructor reactions to the training package and its effects on student behavior, and enthusiastic supervisory and management reactions to the package.

Summary of Findings

The effectiveness of the Student Motivational Skill Training Package was evaluated in terms of its impact on students' (1) knowledge of concepts presented in the skill modules; (2) attitudes and opinions about the training package; and (3) course performance following the skill training. Instructor and course management reactions to the package also provided a source of evaluation information.

Findings relevant to students' knowledge of concepts presented in the seven skill training modules indicated that students participating in the training satisfactorily reached criterion on all end-of-module tests. Results on the pre/post skill training knowledge tests generally indicated that although the groups did not differ in pretest scores, experimental group students compared to control group students had higher scores on both the total posttest and the majority of module sub-scales. On both sets of knowledge measures, then, experimental group students demonstrated that they successfully acquired the concepts presented in the package.

In the area of students' attitudes and opinions about the training package, students' initial attitudes at the end of the training experience and their subsequent attitudes after they were in their technical training course were highly positive. Students indicated that they felt the training concepts and experience (a) would be helpful in both their personal lives

and in their technical training experience, and (b) should be offered to all technical training students. Once experimental group students were in their technical training course, they continued to react positively to the motivational skill training and expressed opinions that the modules gave them concepts that were useful in their coursework and that helped them get ready for studying the course materials and for taking tests.

The findings in the area of student course performance focused on test performance, using measures of block test scores and number of block test failures for experimental versus control group students. Results indicated that experimental group students had significantly higher block test scores and significantly lower block test failure rates than did control group students. These findings suggest that the Package may impact variables related to student attrition from technical training (i.e., number of block test failures)--a suggestion that remains to be verified by subsequent research.

Another source of information on the effectiveness, relevance, and utility of the package comes from the comments and actions of instructors and supervisory and management personnel. Instructors reported that students who had completed the skills training package (1) experienced less absenteeism; (2) appeared to have more confidence about taking tests; and (3) were more actively involved in learning and were not afraid to ask questions.

Reactions of supervisory and management personnel were also positive. They felt that the materials, format, concepts, and range of topics covered

in the package were highly relevant and covered needed areas for technical training students. They also reported that they had observed noticeable effects of the package on the development of positive student motivation, shorter lesson completion times, higher test scores, and fewer failures for experimental versus control group students. Supervisory and management personnel in the PME course have asked that the package be made available in the near future to all students in the course. A study to investigate alternative presentation formats for the implementation of this skill training package in the PME course has been suggested for the near future. Such a study should provide insights into the type of format that is most effective in terms of both student performance gains and instructor participation requirements.

It seems clear from this summary of quantitative and qualitative findings in the evaluation of the Student Motivational Skill Training Package that the package was positively received and that improvements occurred in the performance of Air Force technical training students in the PME course. The findings also suggest there may be some feasibility to the idea of modifying individuals' pre-course skills and strategies such that motivation is enhanced. Some limitations and some additional implications of these findings are presented in the following sections.

#### Limitations to Findings

Conclusions drawn from this evaluation of the Student Motivational Skill Training Package must consider several possible limitations to the study.

(a) Equality of the two student groups (control and experimental) in regard to their aptitude for the PME course is in doubt, leaving some question as to the cause(s) of differences in failure rates and block test scores in that course.

(b) Special non-conventional instruction skills training given to experimental group instructors at the beginning of this study may partially account for the superior PME course performance of the experimental group.

(c) Some of the experimental group improvements in attitude, confidence, motivation, and rapport with instructors and other students might be results of that group's pre-course time together. These students participated in the 4 to 5 days of motivational skill training, which contained small-group discussions, prior to start of the PME course. During that time they experienced peer group support and interactions with the same instructors who later taught them in the PME course.

(d) The Hawthorne effect may account for some motivation-related changes. According to instructor comments, the experimental group students were told that they were in a special group, and this made them feel and act special in their technical training experience.

(e) The two sets of knowledge measures (module tests and pre/posttest) used to demonstrate that experimental group students acquired the motivational concepts have not been validated.

#### Suggested Areas of Future Research

Based on the findings of this study and the implications described in the preceding section, the following areas of future research are suggested:

- (1) A comparison of the effectiveness of the Student Motivational Skill Training Package using different modes of application (e.g., group lecture vs. group lecture and discussion vs. self-paced with and without trained instructors). This study would help to clarify how much each of the following variables contributes to the effect of the training package on student attitudes and performance: the training materials alone; group discussions of the topics presented in the training materials; and trained instructors. Understanding the contribution to the overall effect of the training package is important because, for example, if the materials were found to be equal, or nearly equal, in effectiveness when implemented with and without trained instructors, then it may be more cost effective to delete the instructor training used in the PME effort described herein and let students learn the skills completely on their own. In addition, if presence of instructors does not add to the effectiveness of the training package, it may have value in an exportable, packaged format.
- (2) An investigation of the use of computer-assisted instruction (CAI) for some or all portions of the Student Motivational Skill Training Package should be undertaken. If the study described above were completed and were to indicate that portions of the training package required some type of group or one-to-one interaction, another study might then investigate the extent to which CAI could be used to fulfill these requirements.

- (3) An investigation of the use of peer counseling for some portions of the Student Motivational Skill Training Package. This study would complement information learned in the preceding study and provide information on a potentially effective alternative to CAI. For example, if it were discovered that the training package required some type of group or one-on-one interaction, the extent to which students could be trained as peer counselors to fulfill the interaction requirements would be investigated.
- (4) A study which investigates the degree to which the current version of the package could effectively be individualized. This effort would involve: (1) determining the extent to which individual modules or subsets of modules within the training package result in significant improvements in student course performance; (2) further evaluating whether the individual modules or subsets of modules result in the students' acquisition of the concepts and skills taught and whether the existing skill measures are predictive of student performance in technical training; (3) identifying individual difference factors, from the validated battery of individual difference measures included in this training package, that are differentially predictive of the types of students most likely to benefit from an individual module or subsets of modules and refining this battery; (4) determining the class of adaptive decision models and set of decision rules most appropriate for use in the assignment and reassignment of students to selected training

- modules; and (5) implementing, and evaluating the effectiveness of, the adaptive decision model for enhancing student course performance and/or acquisition of new skills and behaviors.
- (5) An expansion and enhancement of the existing Student Motivational Skill Training Package. These expansions and enhancements could include adding a module that details the role of positive self-control in self-respect, self-esteem, motivation, and achievement. Additionally, on the basis of the results of the investigation described in this report, some revisions or expansions of the existing modules, the practice exercises, the group discussions, and the instructor training would be appropriate and desirable.
- (6) An investigation of other student target groups in both military and civilian training settings. This effort would involve identifying other student groups who could potentially benefit from this type of motivational skill training, defining the characteristics of these groups, and tailoring the existing package to the needs of these groups. For example, the package could be tailored to technical training students of varying ability levels, as well as to military enlistees of various ranks, ages or specialities.

The researchers on this project have developed a set of recommendations for implementing the products of this effort. These recommendations are provided in Appendix C. Any further research on the package should follow these recommendations

carefully in order to insure that organizational change is accommodated in an effective and productive fashion and has minimal impact on the research results.

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APPENDIX A

End-of-Module Tests for  
Student Motivational Skill Training Package

## Module 1

### Introduction Posttest

1. What is the most basic step of Maslow's hierarchy of needs?
  - a. Physical
  - b. Security
  - c. Social
2. If you tell yourself that you are capable and motivated to complete technical training, imagine yourself achieving this goal, and then actually do successfully complete technical training, this is an example of
  - a. positive self-talk.
  - b. self-fulfilling prophecy.
  - c. being your own coach.
3. If you are being your own coach, you will want to
  - a. motivate, calm, and direct yourself.
  - b. correct, punish, and stimulate yourself.
  - c. direct, correct, and evaluate yourself.
4. Using imagination is important because
  - a. it gives you a chance to get away from the situation and think about something else.
  - b. it gives you a chance to rehearse what you are going to say and do and practice success.
  - c. it gives you a chance to correct your mistakes and be positive about the situation.
5. You are reading some technical training material and are having a lot of trouble understanding it. What would be a positive self-talk statement that you could make to yourself?
  - a. I'm smart enough to learn this if the people who had written it had done a better job.
  - b. I'm smart enough to learn this and I am going to learn this. I can do it.
  - c. I'm not as smart as I thought I was so maybe I should give up on learning this information.
  - d. I'm smart enough to learn this but it's so boring that I really don't want to try.
6. How did you like this module?
  - a. very much
  - b. quite a bit
  - c. moderately
  - d. somewhat
  - e. not at all

Module 1 (continued)

7. How useful do you feel the information you learned is to you?
- a. very useful
  - b. quite useful
  - c. moderately useful
  - d. somewhat useful
  - e. not at all useful
8. What level of effort did you choose for the majority of this module?
- a. Level 1
  - b. Level 2
  - c. Level 3

## Module 2

### Values Clarification Posttest

1. What is a value?
  - a. A personal belief, attitude, opinion or behavior
  - b. A preference--something you think is important
  - c. A desire--something you really want to do
2. How do people get their values?
  - a. They are born with them
  - b. They learn them from other people
  - c. They automatically pick them up
  - d. They are given to them by their parents
3. After reading the Values Clarification module, did you select an area to change or improve?
  - a. Yes
  - b. No
4. If you selected an area to improve or change, did you fill out a self-contract?
  - a. Yes
  - b. No
5. Is creating mental pictures--using your imagination--
  - a. easy for you to do?
  - b. difficult for you to do?
  - c. sometimes easy and sometimes difficult?
6. How did you like this module?
  - a. very much
  - b. quite a bit
  - c. moderately
  - d. somewhat
  - e. not at all
7. How useful do you feel the information you learned is to you?
  - a. very useful
  - b. quite useful
  - c. moderately useful
  - d. somewhat useful
  - e. not at all useful
8. What level of effort did you choose for the majority of this module?
  - a. Level 1
  - b. Level 2
  - c. Level 3

## Module 3

### Career Exploration Posttest

1. What is the difference between a decision and an outcome?
  - a. A decision is the act of selecting among two or more options and an outcome is the result of a decision.
  - b. A good decision always leads to a good outcome and a poor decision always leads to a poor outcome.
  - c. A decision cannot be controlled by a person but an outcome can be controlled.
2. What is a good decision?
  - a. One which uses the skills of decision-making to select the option that is most likely to produce the outcome wanted by the person making the decision.
  - b. A decision which is based on all of the facts of the situation and which guarantees the outcome wanted by the person making the decision.
  - c. A decision which produces the outcome wanted by the person making the decision--regardless of how it was made.
3. If a person finds out after reading the Career Exploration Module that he or she wants to pursue a career that is completely different from the military career field to which he or she is assigned, what is the best strategy for that person?
  - a. Look into cross-training procedures and then attend the training for this second career field as soon as possible.
  - b. Develop a plan for getting the most out of their current training and use this experience as a stepping stone for achieving a career which does match their skills, values, needs, and ambitions.
  - c. Develop a plan for either flunking out or getting a motivational drop from their current military technical training course and trying to get into a more appropriate career field.
4. The code which Joe Student identified for himself through the Self-Directed Search is CES. The occupations listed under this code include accountant and credit manager. What can Joe Student say about his code?
  - a. That he would be a good accountant or credit manager and has the skills and abilities to do these jobs well.
  - b. That he should not consider going into any occupations other than those listed under the CES code because he will not enjoy them.
  - c. That his interests and the interests of accountants and credit managers, who are happy with their jobs, are very similar.
  - d. That if he decides to become an accountant or a credit manager, he will definitely be happy with his career.

Module 3 (continued)

5. Career decisions are
  - a. made by most people only once or twice in a lifetime.
  - b. a life-long series of choices.
  - c. generally made once every 5 or 10 years.
  
6. How did you like this module?
  - a. very much
  - b. quite a bit
  - c. moderately
  - d. somewhat
  - e. not at all
  
7. How useful do you feel the information you learned is to you?
  - a. very useful
  - b. quite useful
  - c. moderately useful
  - d. somewhat useful
  - e. not at all useful
  
8. What level of effort did you choose for the majority of this module?
  - a. Level 1
  - b. Level 2
  - c. Level 3

## Module 4

### Goal Setting Posttest

1. What is the purpose of questioning?
  - a. It helps you focus your attention on important information.
  - b. It helps you rehearse what you are going to say and do.
  - c. It helps you build and maintain a positive self-image.
2. What is the purpose of brainstorming?
  - a. To get a group of people to work together to solve a problem.
  - b. To evaluate the usefulness of different alternatives.
  - c. To generate many different alternatives to a problem or a goal.
3. What is the purpose of using imagination in Goal Setting?
  - a. To help you figure out the most effective plan for achieving your dreams and ambitions.
  - b. To help you set up a positive self-fulfilling prophecy and to allow you to rehearse what you will say and do.
  - c. To help you forget about all the problems and difficulties which may be ahead of you.
4. What is a good way to keep yourself motivated to stick with your plans?
  - a. To reward yourself for accomplishing a specific number of tasks.
  - b. To set very high goals that you will have to work extremely hard to reach.
  - c. To plan for how you are going to handle the problems that come up.
5. What are the two guidelines for writing goal statements?
  - a. They should be based on a baseline and a contract.
  - b. They should be definite and have deadlines.
  - c. They should be positive and definite.
6. How did you like this module?
  - a. very much
  - b. quite a bit
  - c. moderately
  - d. somewhat
  - e. not at all
7. How useful do you feel the information you learned is to you?
  - a. very useful
  - b. quite useful
  - c. moderately useful
  - d. somewhat useful
  - e. not at all useful
8. What level of effort did you choose for the majority of this module?
  - a. Level 1
  - b. Level 2
  - c. Level 3

## Module 5

### Stress Management Posttest

1. Which of the following is most likely to lead to feelings of stress?
  - a. changing jobs and job responsibilities
  - b. thinking we are in a situation we can't handle
  - c. having a tight schedule of things to complete
2. Mistaken beliefs can lead to feelings of stress because
  - a. they make us feel helpless and afraid.
  - b. they are beliefs no one else has.
  - c. they lead to negative perceptions of a situation.
3. Why does physical exercise help reduce feelings of stress?
  - a. It slows down our whole system.
  - b. It helps build confidence in our abilities.
  - c. It increases our energy level.
4. Thinking about situations in positive ways helps reduce feelings of stress because
  - a. it helps us be in control of our feelings and physical reactions.
  - b. it makes us believe that nothing harmful can happen to us.
  - c. it convinces us that most situations are not stressful.
5. What is the major problem with using alcohol, drugs, or pills to cope with stress?
  - a. They keep us from effectively interacting with people who could help us.
  - b. They often lead to new problems and increased feelings of stress.
  - c. They are ways of coping that are not socially acceptable.
6. How did you like this module?
  - a. very much
  - b. quite a bit
  - c. moderately
  - d. somewhat
  - e. not at all
7. How useful do you feel the information you learned is to you?
  - a. very useful
  - b. quite useful
  - c. moderately useful
  - d. somewhat useful
  - e. not at all useful
8. What level of effort did you choose for the majority of this module?
  - a. Level 1
  - b. Level 2
  - c. Level 3

## Module 6

### Effective Communication Posttest

1. Leslie is moving from the dormitory on base to an apartment off base. She asked Tim to help her move on Saturday and he agreed. When Saturday morning arrived, Tim told Leslie he was sorry, but he had made some other plans and couldn't help. Which of the following is an assertive way for Leslie to express her feelings?
  - a. "I don't understand how you can let me down like this. You knew that I was really counting on you to help me move."
  - b. "You promised to give me a hand with moving today and now you are backing out of that promise. You can be sure I won't ask for your help again."
  - c. "You agreed to help me move today and yet you went ahead and made other plans. That puts me in a real bind and I feel very angry with you."
2. When people act non-assertively or aggressively, they are often saying
  - a. "I am afraid and uncomfortable in this situation."
  - b. "I want to win and I don't care about your feelings."
  - c. "I like the way I am and you can't change me."
3. The biggest problem with "you-messages" is that they
  - a. put the other person on the defensive.
  - b. make the other person not want to talk to you.
  - c. keep the other person from hearing what you said.
4. How do "I-messages" help you gain control of your life?
  - a. They help keep other people from reacting to you in defensive ways.
  - b. They help you take responsibility for your feelings, wants, and needs.
  - c. They help you understand other people's feelings about you.
5. Effective listening skills can minimize communication problems because
  - a. They give the other person a chance to do most of the talking.
  - b. They help you make sure you understood what the other person said.
  - c. They keep you from using too many "you-messages" with others.
6. How did you like this module?
  - a. very much
  - b. quite a bit
  - c. moderately
  - d. somewhat
  - e. not at all
7. How useful do you feel the information you learned is to you?
  - a. very useful
  - b. quite useful
  - c. moderately useful
  - d. somewhat useful
  - e. not at all useful

Module 6 (continued)

8. What level of effort did you choose for the majority of this module?

- a. Level 1
- b. Level 2
- c. Level 3

## Module 7

### Problem Solving Posttest

1. What two skills have most good problem solvers learned?
  - a. To think systematically and to find the best solutions.
  - b. To find the best solutions and to have confidence in themselves.
  - c. To think systematically and to have confidence in themselves.
2. Countering your problem definition is an effective technique because
  - a. it helps you remember to reward yourself for your successes.
  - b. it helps you set up a positive self-fulfilling prophecy.
  - c. it keeps others from saying things to discourage you.
3. When are positive self-talk and imagination used in solving problems?
  - a. At the beginning of the process.
  - b. At the end of the process.
  - c. Throughout the process.
4. The process of stepping away from the problem for awhile and not trying to solve it immediately is called
  - a. incubation.
  - b. procrastination.
  - c. retreating.
5. Which step of the problem solving process prepares you for handling the difficulties or set-backs that may occur?
  - a. Step 1: Identifying and Defining Your Problem
  - b. Step 2: Generating and Evaluating Alternative Solutions
  - c. Step 3: Making an Implementation Plan
  - d. Step 4: Implementing Your Solution
  - e. Step 5: Evaluating Your Progress
6. How did you like this module?
  - a. very much
  - b. quite a bit
  - c. moderately
  - d. somewhat
  - e. not at all
7. How useful do you feel the information you learned is to you?
  - a. very useful
  - b. quite useful
  - c. moderately useful
  - d. somewhat useful
  - e. not at all useful
8. What level of effort did you choose for the majority of this module?
  - a. Level 1
  - b. Level 2
  - c. Level 3

**APPENDIX B**

**Pre/Post Skill Training Tests for  
Student Motivational Skill Training Package**

## STUDENT SKILLS PRETEST

1. What is the main reason that people experience stress?
  - a. They put themselves in a lot of stressful situations.
  - b. They don't do enough physical activity to reduce stress.
  - c. They see situations as somehow threatening to them.
2. One of the best ways to reduce feelings of stress is to
  - a. try to forget about or avoid the stressful situation.
  - b. think about the stressful situation in positive ways.
  - c. accept the stressful situation as a normal part of living.
3. Do you have any specific goals which you are currently trying to achieve?
  - a. I'm not currently working on any goals.
  - b. I am currently working on one or two goals.
  - c. I am currently working on three or more goals.
4. Goal setting
  - a. gives people a technique or strategy for making their dreams and ambitions come true.
  - b. gives people a lot of trouble because it is impossible to plan that far into the future.
  - c. gives people an effective method for dealing with their personal problems or conflicts.
5. If you had been waiting in line for 30 minutes to cash your check at the bank and the person in front of you let four of his friends break into the line, what do you think is the best way to handle the situation?
  - a. Look angry but don't say anything because there's nothing you can really do.
  - b. Angrily and loudly tell the person that his friends have to go to the end of the line and wait like everybody else.
  - c. Tell the person that you know he'd like to help his friends out but that you don't think it's fair to let people butt in the line.
6. What is one of the best ways to handle a conflict situation with another person?
  - a. Start by telling them "You make me angry when you..."
  - b. Start by telling them "I feel angry when you..."
  - c. Ask them for an explanation for their behavior.
7. Being a good problem solver is:
  - a. a skill some people can do better than others because they were born with it.
  - b. a technique that comes from solving a lot of math problems.
  - c. a method for thinking systematically and being self-confident.

STUDENT SKILLS PRETEST (continued)

8. At this moment, I think my problem solving skills are
  - a. not very good.
  - b. about average.
  - c. pretty good.
  
9. Do you think that you are Occupationally Literate--are you informed about available job options, knowing what skills you have, and understanding your work values?
  - a. Yes
  - b. No
  - c. I don't know
  
10. Have you selected a career goal?
  - a. Yes
  - b. No
  
11. What is a value?
  - a. A personal belief, attitude, opinion, or behavior.
  - b. A preference--something you think is important
  - c. A desire--something you really want to do.
  - d. A motivation--something you want to achieve.
  
12. How do you feel about your value system?
  - a. I haven't really thought about it.
  - b. I have areas I still need to think through.
  - c. I'm not sure what it is.
  - d. I feel comfortable with it.
  
13. Using imagination to solve problems and achieve your goals
  - a. is not a good idea because it allows you to avoid the situation.
  - b. is a good strategy because it gives you a chance to rehearse what you are going to say and do in the "real" situation.
  - c. is a good strategy because it gives you a chance to forget about the situation and take a new point of view.
  
14. Your self-image is basically what you think of yourself. Your self-image is built from
  - a. your parents and your subconscious.
  - b. your experiences and your parents.
  - c. your imagination and your subconscious.
  - d. your self-talk and your imagination.

## STUDENT SKILLS POSTTEST

1. Using imagination to solve problems and achieve your goals
  - a. is not a good idea because it allows you to avoid the situation.
  - b. is a good strategy because it gives you a chance to rehearse what you are going to say and do in the "real" situation.
  - c. is a good strategy because it gives you a chance to forget about the situation and take a new point of view.
  - d. is not a good idea because it is very hard for most people to create realistic pictures in their minds.
2. What is a value?
  - a. A personal belief, attitude, opinion, or behavior.
  - b. A preference--something you think is important.
  - c. A desire--something you really want to do.
  - d. A motivation--something you want to achieve.
3. Do you think that you are Occupationally Literate--are you informed about available job options, knowing what skills you have, and understanding your work values?
  - a. Yes
  - b. No
  - c. I don't know
4. Being a good problem solver is
  - a. a skill some people can do better than others because they were born with it.
  - b. a technique that comes from solving a lot of math problems.
  - c. a method for thinking systematically and being self-confident.
5. If you had been waiting in line for 30 minutes to cash your check at the bank and the person in front of you let four of his friends break into the line, what do you think is the best way to handle the situation?
  - a. Look angry but don't say anything because there's nothing you can really do.
  - b. Angrily and loudly tell the person that his friends have to go to the end of the line and wait like everybody else.
  - c. Tell the person that you know he'd like to help his friends out but that you don't think it's fair to let people butt in the line.
6. What is the main reason that people experience stress?
  - a. They put themselves in a lot of stressful situations.
  - b. They don't do enough physical activity to reduce stress.
  - c. They see situations as somehow threatening to them.
7. Do you have any specific goals which you are currently trying to achieve?
  - a. I'm not currently working on any goals.
  - b. I am currently working on one or two goals.
  - c. I am currently working on three or more goals.

STUDENT SKILLS POSTTEST (continued)

8. Your self-image is basically what you think of yourself. Your self-image is built from
- your parents and your subconscious.
  - your experience and your parents.
  - your imagination and your subconscious.
  - your self-talk and your imagination.
9. At this moment, I think my problem solving skills are
- not very good.
  - about average.
  - pretty good.
10. How do you feel about your value system?
- I haven't really thought about it.
  - I have areas I still need to think through.
  - I'm not sure what it is.
  - I feel comfortable with it.
11. Have you selected a career goal?
- Yes
  - No
12. What is one of the best ways to handle a conflict situation with another person?
- Start by telling them "You make me angry when you..."
  - Start by telling them "I feel angry when you..."
  - Ask them for an explanation for their behavior.
13. One of the best ways to reduce feelings of stress is to
- try to forget about or avoid the stressful situation.
  - think about the stressful situation in positive ways.
  - accept the stressful situation as a normal part of living.
14. Goal setting
- gives people a technique or strategy for making their dreams and ambitions come true.
  - gives people a lot of trouble because it is impossible to plan that far into the future.
  - gives people an effective method for dealing with their personal problems or conflicts.

**APPENDIX C**

**Recommendations for Implementing the Student  
Motivational Skill Training Package**

There are four major variables that need to be addressed by anyone who desires to implement the Student Motivational Skill Training Package. These variables are:

1. The role of organizational change in a successful implementation strategy;
2. The role of the instructors in the classroom or learning center where the package is to be implemented;
3. The role of group process in the success of the training package;
4. The role of the peer group in the success of the training package.

Role of Organizational Change. Implementing any new training program into an on-going operational organization is essentially an exercise in organizational change. Since most people are, at least initially, resistant to change, this can be a very complex task. The unlearning of old and familiar practices and the relearning of new ones often evokes considerable anxiety, insecurity, and resistance on the part of most individuals. Given these realities, effective organizational change necessitates a conscious and deliberate effort on the part of the change agent such that the change process becomes an integral part of the entire program.

After a review of educational research programs, Fullan and Pomfret (1977, p. 394) conclude that "if there is one finding that stands out, it is that effective implementation of social innovations requires time, personal interaction and contacts, in-service training, and other forms of

people-based support." Hartley (1979, p. 53) extends this concept by stating that, "Although a project can benefit from the whole-hearted support of top officials in the system, resistance will be less and change is more likely to occur if those affected feel that the project is their own--not one devised and operated by outsiders. Resistance will be less if participants have joined in diagnostic efforts leading them to agree on what the basic problem is and to feel its importance." Diran's (1978) research also supports this approach and his data reveal that system acceptance is more likely (a) if the system is perceived as operating in the interests of various constituencies and (b) if these constituencies have meaningful input into the design, development, and evaluation of the program.

An approach for implementing the Student Skill Motivational Training Package which considers the role of organizational change would possess the following characteristics: (1) decision-making about how and what to implement takes place at the local level; (2) implementation procedures are defined within a particular context rather than in an abstract, theoretical, or ideal manner (Heck, 1980); and (3) the emphasis is on "establishing acceptable rules of the game that will allow multiple participants to bargain and compromise during the course of implementation" (Berman, 1980, p. 211). Thus, collaboration with practitioners is the core of this approach to implementation--an approach which Shavelson (1981) advocates on the basis that it will also improve the quality of research underlying an operational program. This approach also insures that programs or solutions are not imposed by outsiders. Gagne (1980, p. 5) indicates that one of the characteristics of a successful

implementation program of which he was a part was that "solutions were in no way imposed from 'outside' or 'above.'" The type of power that an individual uses to bring about change is, therefore, critical to the success of the implementation.

The type of power which is most detrimental to an implementation process is one of positional power--implementing change through direct order. Personal power to influence change seems to be much more appropriate even though "the expediency of telling or ordering change seems to seduce many to believe that if only they had positional power, things would be different (and better?)" (McGreevy, 1978, p. 434). The role of the researcher/implementer would, accordingly, be one of a stimulator and consultant, not the director or the doer (Klausmeier, 1981).

*Our recommendations for implementing the Student Motivational Skill Training Package* would, accordingly, begin with the implementers and users (instructors and supervisors) coming together as equals and designing an implementation strategy which served the needs of each of the participants. It is our experience that it is important to include the supervisors or managers as well as instructors on the implementation team so that all levels responsible for technical training understand and appreciate the new procedures and strategies being used in the learning centers or classrooms. During this first stage of the implementation process, the implementers, instructors and supervisors establish a realistic time schedule for various activities and stages in the implementation process and identify the goals of the implementation strategy. This first activity would be called the conceptualization stage.

The next step in the implementation process would be to provide each of the users with a set of the Student Skills Training materials such that they could decide where, how, and to what extent the materials needed to be modified, revised or redirected to reflect the needs of the user and his or her environment. This second activity would be called the Design stage.

The third implementation activity would be to solicit the comments, suggestions, and criticisms of the users and to incorporate them into a revised Student Motivational Skill Training Package. These revised materials would then be submitted to the users to assess whether or not the changes they suggested were made appropriately and to give the users another chance to have input into the revisions of the materials. This third activity would be called the Development stage.

Once a set of revised materials that both the users and the implementers find acceptable has been achieved, the next stage would be to subject the revised materials to a formative evaluation. The purpose of this evaluation would be (a) to ascertain the degree to which the materials achieved the goals they were designed to meet; (b) to obtain suggestions, critiques, and comments from the students; and (c) to identify any confusing, illogical, or incorrect information contained within the materials. On the basis of this information the materials would once again be revised. It is important to note that during formative evaluation the instructors become the learning strategies experts and interface with the students. Instructors provide the selected students with the materials being evaluated, answer student questions about the materials, and insure that the desired feedback from students is obtained.

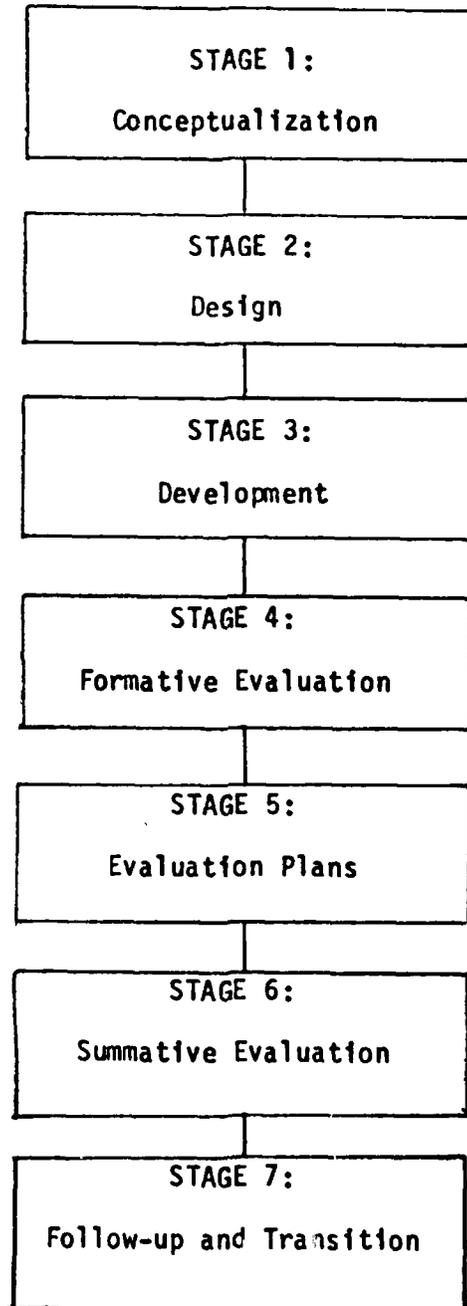
The next stage is to establish a set of Evaluation Plans. These plans would include an appropriate evaluation design, a time schedule for various evaluation activities, the identification of specific variables to be assessed, the definition of experimental and data collection activities, the identification of individuals responsible for conducting various experimental and data collection procedures, and the identification of specific types of statistics to be used in the analysis of evaluation findings.

After a thorough evaluation plan has been developed, the sixth stage is to implement that plan and carefully monitor it throughout the Summative Evaluation stage. As in the formative evaluation, instructors during summative evaluation become the learning strategies experts and learning facilitators. They interface with students, answering their questions, guiding them in the use of the new skills, and generally fulfilling their normal role as an instructor of new information.

When the summative evaluation has been completed and the data have been analyzed, it is imperative for the implementers and the users to participate in the Follow-up and Transition stage--to discuss the results and on the basis of these data, decide whether or not the revised Student Motivational Skill Training Package is achieving the goal that it was designed to meet. If it is not, decisions need to be made as to why it is not achieving these goals and what the team of implementers and users wants to do about this inadequacy. (See Figure 1 for a summary of recommended implementation stages.)

FIGURE 1

Stages in the Recommended Implementation Strategy for the  
CMI Instructor Role Training Package



Role of Instructors. The instructor's role in the implementation process is one of teammate on the implementation team as well as learning strategies expert during the formative and summative evaluations. With respect to the latter responsibility, there are six different ways in which instructors can help students acquire and maintain new skills:

First, instructors can help students apply the new skills to new situations; demonstrate new applications; and provide new and different examples.

Second, instructors can model the new skills, showing students how they, as instructors, apply, implement, and make use of the new skills.

Third, instructors can remind students of how and when to use the new skills in new situations. They can also increase the amount of practice that students experience in using these new skills by creating new situations which call for the use of these skills.

Fourth, instructors can monitor the progress charts or maintenance charts that students are required to keep as part of the skill training. This insures not only that the students maintain these charts, but also allows the instructors to provide individual guidance to those students who need additional assistance in understanding and applying the new skills, or maintaining the charts.

Fifth, instructors can provide a very effective and consistent reward system for students participating in the new program. Again, personal contact is a strong force and can be used by instructors to motivate students.

Finally, instructors can make the new skills to be learned enjoyable, entertaining, and even profitable for their students. By calling out the unusual, the humorous, or even the "sexy" aspects of the new skills, instructors can help students easily and quickly remember the new skills.

Role of Group Process. Another variable which appears to contribute to the success of the implementation of the Student Motivational Skill Training Package is the role of group process. The group training experience and, in particular, the group discussions which are part of the training, seem to be very important for helping students clarify, understand, and apply new skills presented in this package. The instructors' responsibilities in these groups are not those of lecturer or dispenser of information, but rather those of group facilitator, clarifier, and promoter of communication between students. In this situation, the instructors' use of active listening and clarifying statements is critical for effective performance as group leaders.

For the student, the group discussions can become a place where they can role-play and practice specific new skills and behaviors. Students also have the opportunity to share with each other some of their feelings, opinions, beliefs, and uncertainties, and this in turn helps them realize that they are not the only ones experiencing confusions and uncertainty in various aspects

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STUDENT MOTIVATIONAL SKILL TRAINING PACKAGE: EVALUATION  
FOR AIR FORCE TEC. (U) MCDONNELL DOUGLAS ASTRONAUTICS  
CO-ST LOUIS MO B L MCCOMBS ET AL. DEC 82

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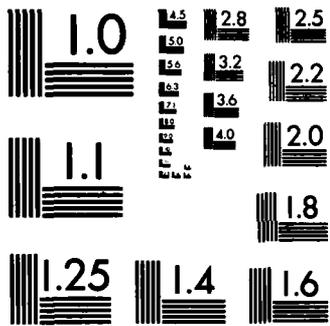
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of their lives. In general, then, group process provides the function of enhancing, and allowing students to elaborate on and refine, skills and strategies learned in the self-instructional skill training package.

Role of the Peer Group. The sharing of feelings and beliefs with their peers leads to the formation of a peer group--a group that can meet some of the social and belongingness needs of the technical training student. Meeting these needs is important, particularly in training situations where students don't know each other and/or where students are required to adapt to a variety of novel requirements. Our experience is that this peer group can have a positive effect on learning strategies skill training such as the Student Motivational Skill Training Package. Students can help each other see the need for and value of new skills and strategies, as well as help each other maintain the skills and implement the new behaviors. Students can help each other when they get discouraged or forget to use their new skills and by so doing, the student peer group can be a very effective skill maintenance tool.

Although this approach to implementation may seem to involve a great deal of effort, it is our experience that tailoring a set of materials to the specifics of an environment and doing this tailoring via a team approach with the implementers and the users coming together as equals, each of whom has his or her unique expertise to contribute to the team, is an approach which is much more likely to result in a successful implementation than a more direct, positional power oriented approach. That is not to say that

this approach is without its problems (e.g., it is time-consuming, it requires that the researcher possess good human relations and communication skills). This is only to say that if the goal is to implement the Student Motivational Skill Training Package, or any other such innovation, and to maximize its effects, this team approach to the process is the strategy most likely to minimize conflict and stress and maximize the positive effects of the new package.

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