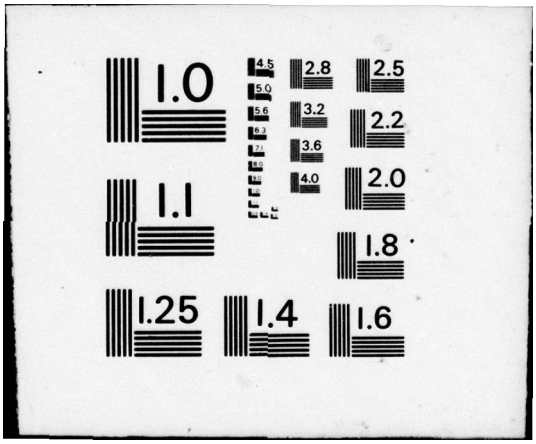
AD-A035 327 HUMAN RESOURCES RESEARCH ORGANIZATION ALEXANDRIA VA F/G 5/9
UTILIZATION OF PEER INSTRUCTION IN AIR FORCE TECHNICAL TRAINING--ETC(U)
AUG 76 J E HUNGERLAND, J E TAYLOR F44620-74-C-0007
UNCLASSIFIED HUMRRO-FR-WD-CA-76-12 AFOSR-TR-77-0029 NL

1 OF 1
ADA035327

END

DATE
FILMED
3-77


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6

AFOSR - TR - 77 - 0029

HumRRO

HumRRO
FR-WD-CA-76-12

ADA035327

Utilization of Peer Instruction in Air Force Technical Training

by

Jacklyn E. Hungerland
John E. Taylor
Mark F. Brennan

HUMAN RESOURCES RESEARCH ORGANIZATION
300 North Washington Street • Alexandria, Virginia 22314

August 1976

Prepared for

Air Force Office of Scientific Research
Bolling AFB, D.C. 20332

DDC
RECEIVED
FEB 9 1977
D

Approved for public release;
distribution unlimited.

AIR FORCE OFFICE OF SCIENTIFIC RESEARCH ([redacted])
NOTICE OF TRANSMITTAL TO DDC
This technical report has been reviewed and is
approved for public release IAW AFR 190-12 ([redacted])
Distribution is unlimited.
A. D. BLOSE
Technical Information Officer

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: AFOSR-TR-77-0029
2. GOVT ACCESSION NO.
3. RECIPIENT'S CATALOG NUMBER: Rept. for
4. TITLE (and Subtitle): UTILIZATION OF PEER INSTRUCTION IN AIR FORCE TECHNICAL TRAINING.
5. TYPE OF REPORT & PERIOD COVERED: 1 Sept 74 — 31 Aug 76,
6. PERFORMING ORG. REPORT NUMBER: FR-WD(CA)-76-12
7. AUTHOR(s): Jacklyn E. Hungerland, John E. Taylor, Mark F. Brennan
8. CONTRACT OR GRANT NUMBER(s): F44620-74-C-0017
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Human Resources Research Organization, 300 N. Washington Street, Alexandria, VA 22314
10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: 61102F 9778 62
11. CONTROLLING OFFICE NAME AND ADDRESS: Air Force Office of Scientific Research, Bolling AFB, D.C. 20332
12. REPORT DATE: August 1976
13. NUMBER OF PAGES: 76
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)
15. SECURITY CLASS. (of this report): Unclassified
15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release;
distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)
18. SUPPLEMENTARY NOTES

Research performed by HumRRO Western Division, Presidio of Monterey, California

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Peer instruction
Performance oriented training
Performance oriented testing
AF Technical Training
Job simulation training
Initial job performance
Instructional technology
Instructor training
Implementation

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The purpose of the project was to determine the applicability of peer instruction to Air Force technical training. The Communications Center Specialist Course (3ABR29130) at Sheppard AFB was converted from conventially presented instruction to a 100% criterion peer-instructional model. The first 50 graduates of the newly configured course were tracked to their initial duty assignments for mail survey follow-up. Their first-line supervisors were also surveyed by mail. In addition, selected sites were visited for the purpose of

Continued

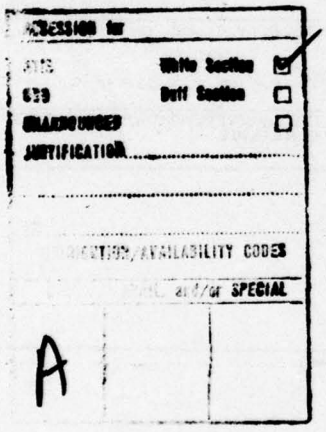
DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

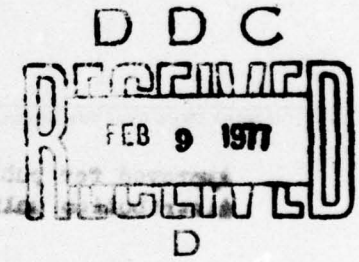
UNCLASSIFIED 405 260

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

20. *Continued*

interviewing 21 of the 50 graduates and their supervisors. Data were collected on course performance, job performance, motivation, attitudes and up-grade training progress of the peer-instructed students. Peer-instructed students performed as well as or better than conventionally trained students in the course. In the field, peer-instructed graduates: a) Were prepared to do their jobs when they arrived at their duty stations; b) Met or exceeded their supervisors' expectations of a new Tech School graduate; c) Required an average amount or less than an average amount of supervision; d) Were favorable toward peer instruction over other methods for learning their job skills; e) Were highly motivated and positive in attitude; f) Were completing their up-grade training on schedule with few difficulties; g) Were satisfied with their job assignments. It was concluded that an adapted peer-instructional model can be used more widely in the Tech Training Base and in the field to provide improved job preparation of students (100% criterion), produce highly motivated students and reduce training time (and costs) through self-pacing.





SUMMARY AND CONCLUSIONS

PURPOSE

The purpose of this project was to determine the applicability of peer instruction to Air Force technical training. This included:

1. Selecting and guiding the conversion of one Technical School basic skills course to operate under the fixed-pace peer instruction model.

2. Assisting course administrators, supervisors and instructors in dealing with operational and managerial problems related to the phase-in and operation of the course.

3. Conducting a field follow-up on a sample of peer-instructed graduates to determine their performance and demonstrated potential in their first duty assignments.

APPROACH

Working in close cooperation with representatives of the Air Training Command, the Human Resources Laboratory (Lowry) and the School of Applied Aerospace Sciences, the Communications Center Specialist Course (3ABR29130) conducted at Sheppard AFB was selected for conversion to peer instruction. Two communications-experienced NCOs were assigned full time to the project to serve as content experts and to develop instructional guides and performance tests for use in the converted course. The existing Specialty Training Standard defined the content of the course; no change of content was made to support or effect the conversion to peer instruction.

Phase-in of peer-instructional modules began in May of 1975 and was completed in October 1975. Instructional materials, tests and procedures were pilot-tested and baseline data were collected prior to the phase-in of each module. The first class of totally peer-instructed students completed the course in December 1975.

For the field follow-up, the first 50 totally peer-instructed course graduates were designated as the sample. These 50 graduates represented the first four classes to complete the course under peer instruction. In early June 1976, mail surveys were sent to these 50 incumbents and to their first-line supervisors to obtain information on incumbents' initial job performance, progress in up-grade training, and attitudes. In July 1976, site visits were made to interview 21 of the 50 incumbents and to interview their supervisors for more in-depth information than could be provided on a mail survey.

FINDINGS

Overall, performance of the peer-instructed students in the course was equal to or better than that of the baseline group. Peer-instructed students also appeared to retain their skills better.

In the course, peer-instructed students reported significantly more often than the baseline students that they had more skill practice, had less trouble staying awake in class, had less trouble with their attention wandering in class, that their tests reflected their performance abilities rather than their ability to memorize information and that they had practiced the skills enough to become proficient.

Course instructors were, overall, doubtful or negative about the peer-instructional system, its effectiveness, efficiency and feasibility.

On 18 of the 19 major job task areas, the majority of supervisors in the field rated the peer-instructed incumbents as "prepared" when they began their duty assignments. Incumbents rated themselves "prepared" on all job tasks.

Incumbents' attitudes and motivation were rated highly on self-ratings and supervisor ratings.

Incumbents were progressing with their up-grade training with little or no difficulty.

Incumbents expressed a preference for peer instruction over other instructional methods.

Incumbents were rated by their supervisors as equal to or better than previous Tech School graduates on job performance and amount of supervision required.

Various reports by supervisors and incumbents indicated that there are some discrepancies between training course content and field job task requirements. Supervisors reported, however, that the incumbents were getting sufficient theoretical background in the course.

CONCLUSIONS

1. Peer instruction improved the quality of course output in that it imposed higher performance standards (100%) and focused on the mastery of job skills.

2. The peer-instructional system was sufficiently flexible to accommodate problems such as: a) uneven inputs; b) staff shortages; and c) instructor resistance.

3. Student performance and instructor evaluations of student performance in the course appeared to be satisfactory estimates of job proficiency and up-grade training progress in the field.

4. Peer-instructed graduates:

a. Were prepared to do their jobs when they arrived at their duty stations.

b. Met or exceeded their supervisors' expectations of a new Tech School graduate.

c. Required an average amount or less than an average amount of supervision.

d. Were favorable toward peer instruction over other methods for learning their job skills.

e. Were highly motivated and positive in attitude.

f. Were completing their up-grade training on schedule with few difficulties.

g. Were satisfied with their job assignments.

5. To facilitate utilization of peer-instructional techniques in the Technical Schools, student-centered, performance-oriented instructional techniques should be developed and included in the Air Force instructor and training manager courses.

6. To receive the range of benefits possible from peer instruction, the specified instructional model must be followed carefully and monitored via an internal quality control system.

7. The basic (fixed-pace) peer-instructional model can be adapted/modified to provide open access, open exit, full self-pacing with performance-oriented training and testing.

8. An adapted peer-instructional model can be used more widely in the Tech Training Base and in the field to provide improved job preparation of students (100% criterion), produce highly motivated students and reduce training time (and costs) through self-pacing.

PREFACE

The research reported here was conducted as a sub-effort of HumRRO Work Unit AFTEC under AFOSR/HumRRO Contract Number F44620-74-C-0007, "Basic Research Relevant to U.S. Air Force Technical Training," with Dr. Edgar M. Haverland as Principal Investigator. The project, which began in August 1973 and was completed in August 1976 developed and tested a model for matching training approaches with training settings and (in this sub-effort) investigated the utilization of peer instruction in Air Force technical training.

This sub-effort was conducted by HumRRO, Western Division, at the Presidio of Monterey, California, with Dr. Howard H. McFann as Director. Dr. John E. Taylor, Ms Jacklyn Hungerland, COL Mark F. Brennan (USA, Ret.), Mr. Kent Huff and Miss Wendy McGuire comprised the research staff.

Administrative and logistical support for the sub-effort was provided by the Air Training Command, the School of Applied Aerospace Science at Sheppard AFB and the Air Force Human Resources Laboratory at Lowry AFB.

Special acknowledgement is made of the participation of MSGT Cannon and MSGT Lloyd Lueck, whose efforts in developing materials and on-site assistance in conducting the effort were invaluable.

PRECEDING PAGE BLANK-NOT FILMED

TABLE OF CONTENTS

	Page
SUMMARY AND CONCLUSIONS	1
PREFACE	5
INTRODUCTION	11
I. COURSE SELECTION, CONVERSION AND FINDINGS	13
Purpose	13
Course Selection	13
Conduct of Project	14
Development of Instructional Materials and Course Conversion	15
Data Collection Procedures	17
Findings	20
II. FIELD FOLLOW-UP OF PEER INSTRUCTION GRADUATES	31
Purpose	31
Data Collection Procedures	31
Findings	33
III. DISCUSSION	51
"In-House" Issues	51
Limitations of the Fixed-Pace Peer Instruction Model	52
IV. CONCLUSIONS	55
Peer Instruction in the Communications Center Specialist Course	55
Peer-Instructed Graduates in the Field	55
Peer Instruction Potential in the Air Force	55

PRECEDING PAGE BLANK-NOT FILMED

APPENDIX Page

A End-of-Course Survey 59

B Incumbents' Mail Survey 61

C Supervisors' Mail Survey 65

D Incumbents' and Supervisors' Interview Guides . . 70

List of Illustrations

FIGURE

1 Schedule for Course Development, Phase-In and Evaluation 18

List of Tables

TABLE

1 Comparative Student Descriptive Profile 21

2 Comparison of Test Performance of Conventional vs Totally Peer-Instructed Students 22

3 Constructed Comparison of Performance of Module 1, 2 and 3 Skills by Conventional and Peer-Instructed Students 24

4 Change of Instructor Opinions after Introduction of Peer Instruction 26

5 Student Opinions: Pre-and Post-Introduction of Peer Instruction 28

6 Student Opinions: Peer Instruction 29

7 Frequencies of Individual Supervisor and Incumbent Responses in Column E, "Task Not Required at This Duty Station" 35

8 Frequencies of Supervisor-Incumbent Paired Responses in Column E, "Task Not Required at This Duty Station" 36

9 Frequencies of Supervisor and Incumbents Ratings of Job Proficiency Level (Columns A-D) 37

Page

10 Supervisor and Incumbent Ratings of Incumbents' Initial Job Proficiency Level 38

11 Additional Incumbent Mail Survey Items and Response Frequencies 40

12 Incumbent Comments Regarding Advantages/ Disadvantages of Peer Instruction 41

13 Additional Supervisor Mail Survey Items and Response Frequencies 42

14 Final Supervisor Mail Survey Items and Response Frequencies 43

INTRODUCTION

This report presents the procedures and findings of one segment of activities conducted under AFOSR/HumRRO Contract Number F44620-74-C-0007, "Basic Research Relevant to U.S. Air Force Technical Training." This project, which studied the utilization of peer instruction in an Air Force Technical Training Course, was initiated in response to Air Training Command's Request for Personnel Research (RPR) 73-36.

An earlier progress report provides a detailed presentation of project activities from 1 September 1974 to 31 August 1975.[1] Formal briefings on the conduct and findings of the peer instruction project were presented in March 1976, covering activities through December 1975.[2] Subsequent to these briefings, and following interest expressed by Air Force agencies, a modification to the contract was issued providing for a field follow-up on a sample of peer-instructed graduates from the project course.

This report is presented in sections corresponding to the two major phases of the project. Section I presents the essence of the March briefings covering the course selection and conversion activities and findings. Section II presents the conduct and findings of the field follow-up. Discussion and conclusions based on the overall findings and implications follow these sections.

---

[1] See Haverland, E.M. and Hungerland, J.E., *Transfer and Use of Training Technology in Air Force Technical Training: A Progress Report,* HumRRO Report IR-ED-75-24, October 1975.

[2] See Hungerland, J.E. and Taylor, J.E., Briefings presented at SAAS, Sheppard AFB and Air Training Command, 29-30 March 1976.

PRECEDING PAGE BLANK-NOT FILMED

I. COURSE SELECTION, CONVERSION AND FINDINGS

PURPOSE

The purpose of the peer instruction project was to determine the applicability of peer instruction to Air Force technical training. It was not intended to test the efficacy of peer instruction as a technique for conducting training—such had already been demonstrated in diverse military and civilian settings.[1]

Work on the project began with a coordination meeting involving representatives from HumRRO, Air Training Command, the Technical Training Division of the Air Force Human Resources Laboratory, and the School of Applied Aerospace Sciences at Sheppard AFB, where it was planned to conduct the project. Discussions were held regarding the selection of the course to be used as a research/demonstration vehicle, the approach to be used, support required, and a milestone schedule of the R&D activities to be undertaken.

COURSE SELECTION

The six criteria which were followed in selecting a course to be used as the experimental vehicle were:

1. Student flow should be reasonably high and not vary sharply and unpredictably.

2. The course should be one that is not likely to be discontinued in the next few years.

3. Students entering the course should be of fairly widely varying aptitudes, since the peer instruction method was designed to deal with students of a wide range of aptitudes in the same course.

---

[1] *Development and Implementation of a Quality-Assured, Peer Instructional Model*, by Kenneth Weingarten, Jacklyn E. Hungerland, and Mark F. Brennan, HumRRO Technical Report 72-35, November 1972.

Development and Pilot Test of a Career-Oriented, Peer Instructional Model in the Office Cluster of Business Occupations, by Jacklyn E. Hungerland, Eugene R. Michaels, and John E. Taylor, HumRRO Technical Report 72-28, October 1972.

PRECEDING PAGE BLANK-NOT FILMED

4. The existing course staff should be at least reasonably receptive, and enthusiastic about the proposed change. Further, the course should be relativey adequately staffed, so that participation in the development of the peer instruction course on a part-time basis would not be an unreasonably heavy burden on the staff.

5. The course should have gone through Instructional Systems Development (ISD) to accomplish analysis of systems requirements, definition of training requirements, and derivation of training objectives.

6. Since the course would be the first Air Force technical training course in which peer instruction was to be implemented, it should be a prototype for the application of peer instruction in other AF technical training courses. Therefore, the course chosen should be a good demonstration vehicle--one that covers a wide range of skills.

Application of these criteria, in consultation with SAAS personnel, resulted in selection of the Communication Center Specialist Course (3ABR29130).

CONDUCT OF PROJECT

HumRRO was responsible for all technical aspects of the project: project design, scheduling and accomplishment of activities required to convert the course, supervision of training and testing materials development, orientation of instructional and administrative staff, data collection and analysis, and reporting of project findings.

Air Training Command provided official Air Force sanction of the project, maintained a flow of students through the course, and authorized relief from the regulations and current procedures which governed conventional conduct of the course and which would have hampered implementation of the departures from conventional practice required to implement peer instruction.

Sheppard AFB provided access to its Communications and Missile Training Department and Training Research Applications Branch (TRAB) as follows:

The Communications and Missile Training Department supported the project with the facilities, students, instructors and administrative staff of its Communications Center Specialist Course which served as the experimental course for conversion to peer instruction. The department also selected and assigned two NCOs to the project who were conversant with the course and with training policies and school resources, and who were field-experienced in Air Force communications. These NCOs functioned as the on-site translation

link between the HumRRO staff and course administrators and instructors.

The TRAB monitored progress of the project, provided liaison with ATC, solved problems as they arose, and generally served to protect the research project from the detrimental effects of outside influences.

DEVELOPMENT OF INSTRUCTIONAL MATERIALS AND COURSE CONVERSION

Organization of Task Lists

Using the interim Specialty Training Standard (STS), then under field review, as the basis for task and standards definition, the varied job tasks of the Communications Center Specialist were organized into integrated clusters, each forming a sub-component of the Comm Center Specialist's total job.

All job tasks that were related to the performance of a duty position (*e.g.*, DSTE operations, message preparation) were clustered together. These clusters of tasks constituted the content for the instructional modules to be used in the peer instruction course. Since the course had previously undergone a thorough Instructional Systems Development, the tasks contained in the STS were accepted by the research team as having been field-validated.

The major duty positions (task clusters) so constructed were:

1. Message Preparation (structure and format)
2. Processing (receipt of) Narrative Messages
3. Sending Narrative Messages
4. Preparation and Processing of Data Messages
5. Operation of Digital Subscriber Terminal Equipment (DSTE)
6. On-Line Cryptographic Operations
7. Off-Line Cryptographic Operations.

The seven instructional modules developed and implemented in the peer instruction course paralleled the job task requirements of these seven duty positions. These modules are presented above in the sequence in which they were taught in the course. As an adjunct and concurrently running instructional sequence, teletypewriting was taught from the day of entry into the course so that when it was required for duty performance (in Module #3, Sending Narrative Messages), students had acquired at least some proficiency in the skill. Each student continued teletypewriting practice along with instruction in the seven job-related instructional modules until skill proficiency standards were attained.

Preparation of Performance Tests and Support Documents

Approximately six months were devoted to the preparation of the documentation required for implementing peer instruction in the course. Working in close coordination with, and following the guidance of the HumRRO staff, the two project NCOs drafted the performance tests, student skill acquisition guides, job performer guides, peer instructor guides, and supervisor guides required for each of the instructional modules. All tests and student skill acquisition guides were derived from the STS and the task clusters for the several duty positions for the job. All tasks required for the apprentice level skills (3-level) by the STS were included in the peer instruction program.

As performance tests and documents required to support training were prepared by the project NCOs under guidance of the HumRRO staff, they were reviewed by course instructional personnel for completeness and accuracy. All test performance standards were set at 100% (Go-No/Go). Time standards for completion of performance required on each of the tests were determined empirically through tryout during module development.

Instructor Orientation

Several orientation/training sessions were conducted for course personnel and instructors during the development and implementation phases of the project. Initially, sessions were held to explain the instructional system, the purpose of the project and the projected schedule of activities. Instructor involvement in the developmental and implementation activities was discussed in an attempt to clarify their roles. Question and answer sessions revealed considerable skepticism on the part of the instructors and some anxiety as to their roles. In an attempt to alleviate these problems, particular attention was given during the project to further instructor orientation and training. On each visit of the research team to Sheppard AFB, group sessions were held with the instructors to give them a chance to express their questions, doubts and feelings in regard to the project. Instructors were given additional individual information and attention whenever they indicated a need or desire for such.

Prior to the phasing-in of each module, the instructors in that module were given concentrated training on test administration, student and module management, use of support documents, maintenance of performance and data records and conduct of job performance quality control checks.

Phase-In of Instructional Modules

Phase-in of the peer instruction modules occurred when the performance tests and support documents for each module were found, through pilot tests, to be ready for use. Modules were phased-in from the end of the course (Module 7) toward the beginning of the course (Module 1) so that there was no interruption of course output. Succeeding classes received gradually diminishing amounts of conventional instruction followed by increasing amounts of peer instruction as phase-in proceeded from Module 7 through Module 1.

As phasing-in took place, tests and support documents were further refined. Time allocations for each module—initially estimated on the basis of the amount of time devoted to that subject matter in the conventional course—were re-determined empirically.

Phasing-in of modules proceeded according to the schedule shown in Figure 1.

Problems Encountered

Student input. Projected student inputs for the course had been estimated by AF manpower personnel to be between 19 and 25 students per week. Early in the project, inputs held fairly steadily at 19 per week. However, starting approximately mid-way through the project, weekly inputs varied markedly, with classes ranging in size from 7 to 26.

While the peer-instructional system accommodated such marked fluctuations in input the effect was not inconsequential, as this fluctuation caused a 50% reduction in the sample of students who graduated from the entirely peer-instructed system prior to the completion of data collection in December 1975.

Manpower. Although the research agreement suggested that the course should be fully manned or overmanned with instructor personnel for the duration of the research project, the manpower system was unable to meet these requirements and the course was operated with fewer staff than that indicated in optimal allocations. This situation made full participation of course personnel in the initial development and refinement of tests and support materials practically impossible, the major effort being carried out by the two project NCOs.

DATA COLLECTION PROCEDURES

Performance Data

For each module, baseline (control) data were collected by administering the Go/No-Go performance tests to students who had received

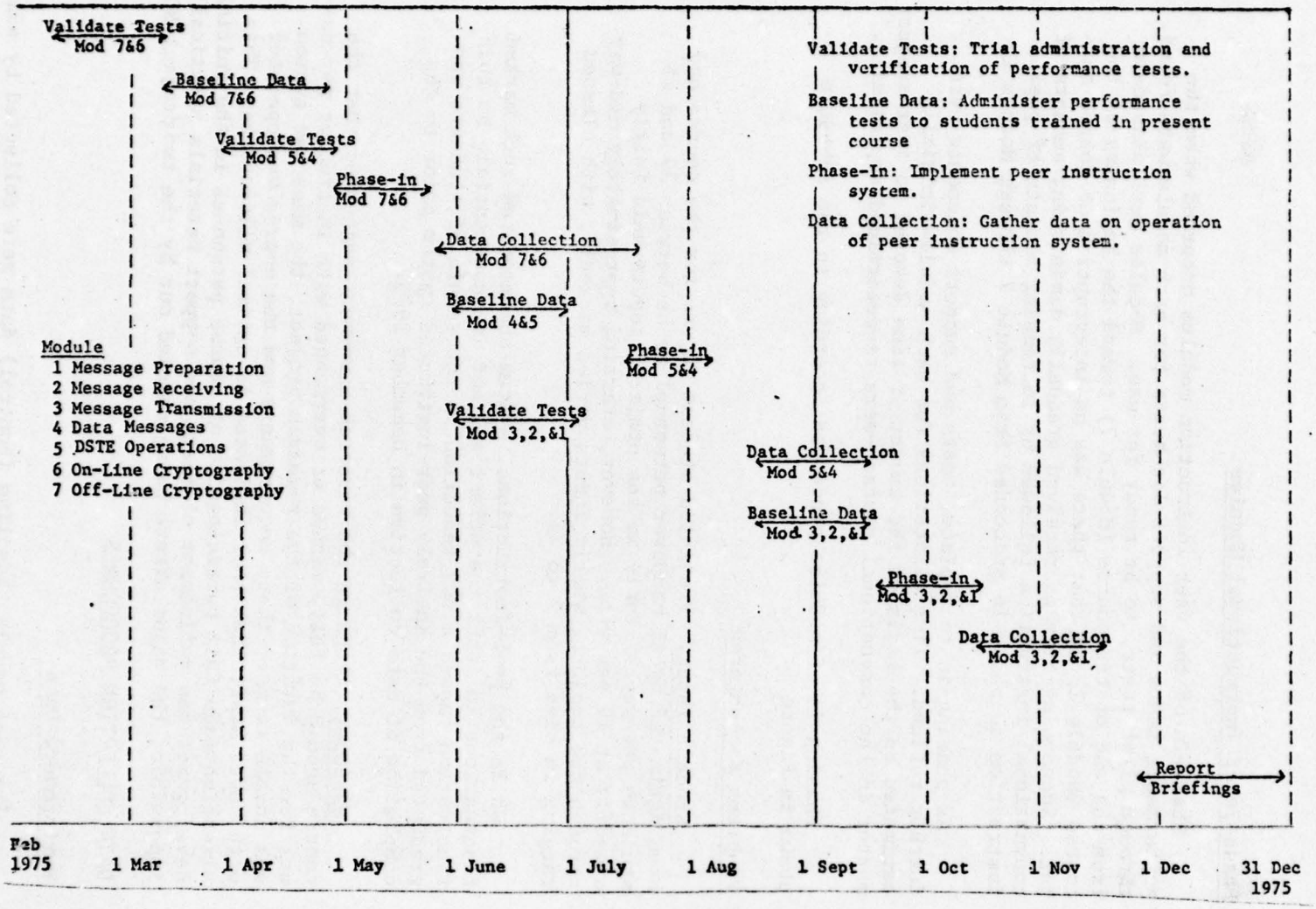


Figure 1. Schedule for Course Development, Phase-In, and Evaluation

that content via the conventional training system. Peer instruction (experimental) data were collected by administering the same tests to students who had received that content via the peer instruction model.

Because conventional course testing was paper and pencil, with a 60% criterion, baseline students were given the opportunity to re-take the performance tests more than once, in order to constitute a first-time, second-time and third-time pass/fail record for a control data pool. All students undergoing peer instruction were required to meet the 100% criterion during training and their first-, second- and third-time pass/fail records were available to constitute an experimental comparative data pool. Procedures specified for the recording of first-, second- and third-time pass/fail records for the conventionally trained students were not followed by all of the evaluators in the course, resulting in incomplete data for second- and third-time trials. Data were, therefore, analyzed and are reported on a first-time trial basis for both groups.

Attitude Data

Prior to the phase-in of any instructional modules an attitude/expectations survey was administered to the instructors. Instructor attitudes were surveyed again after completion of the phase-in and after a period of operation of the entire course under peer instruction.

Three student opinion surveys were developed. Student Opinion Survey I was administered to students prior to their entrance into a peer-instructional module, but following conventional instruction. This survey was designed to sample student opinions of the conventional training program only.

Student Opinion Survey II was administered to students after their experience in the peer-instructional module(s), *i.e.*, at graduation time, and was designed to sample their opinions of only that portion of the course that had been converted to peer instruction. This survey contained the same questions as those in Survey I with the addition of several questions relevant only to peer instruction.

Student Opinion Survey III was developed for administration to students who received only peer instruction throughout the course. This survey was designed to sample student expectations regarding peer instruction and was administered after an orientation briefing at course entry .

All student surveys were anonymous and are reported as group data.

Additional Data

ATC Form 156 descriptive data (education, aptitude area scores, AFQT, etc.) were collected for all baseline and experimental students. Additional data regarding use of facilities, equipment and instructor personnel were collected. Possible time and manpower reductions were determined empirically during phase-in of the peer-instructed modules.

FINDINGS

Student Descriptive Profiles

There was no selection of inputs or participants in the peer instruction project; student assignment and input was conducted through normal operational channels. The student samples were essentially alike on relevant comparative dimensions.

Data are presented in Table 1 on baseline students, partially and totally peer-instructed students on: years of schooling, AFQT scores and general (aptitude) scores. These data represent inputs over a period of six months, starting with inputs to Modules 6 and 7 in May 1975 and proceeding through October 1975 (totally peer-instructed). All samples exhibited (on the average) a high school education, were in aptitude Category III and met or exceeded the minimum 60 point general score required for entry into the course.

Student Performance

Performance data are presented by module in Table 2. These data represent a first-time pass rate. Unlike the baseline students (who had to meet a 60% criterion), all peer-instructed students eventually had to achieve 100% correct performance if they did not do so on this first-time test trial. In other words, while the first-time pass rate for peer-instructed students may not reflect 100% in these data, they were required to achieve 100% before proceeding to the next module and would have achieved 100% in all modules before graduating from the course.

Significant differences (all being in favor of the peer-instructed students) in first-time pass rate are noted in Table 2 on four skill operations. The two instances in which the baseline students performed better than the peer-instructed students ("CR" and "PP" in Module 5) were not significant.

The "No data" items in Modules 5 and 6 had been presented in the conventional course as knowledge items with paper and pencil testing. In the peer instruction system these subjects had been

TABLE 1. COMPARATIVE STUDENT DESCRIPTIVE PROFILE.

Descriptive Dimension	Baseline[1] Modules 6 & 7			Module 5			Module 4			Partially Peer-Instructed Classes 0306-0818			Totally Peer-Instructed Classes 0930-1007		
	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N
Years of Schooling	12.00	.3535	17	11.84	.8466	32	12.07	.2581	15	12.08	.7296	156	12.05	.5747	37
AFQT Score[2]	63.12	20.35	17	62.73	14.88	30	65.73	12.08	26	62.93	14.13	222	63.15	15.83	20
General Score[3]	71.09	11.28	23	71.19	10.35	42	74.64	9.22	28	71.82	10.03	371	72.71	10.63	24

[1]Baseline data not available for Modules 1, 2 and 3

[2]Varying Ns governed by availability of data

[3]Minimum score for selection = 60

TABLE 2. COMPARISON OF TEST PERFORMANCE OF CONVENTIONAL VS TOTALLY PEER-INSTRUCTED STUDENTS

Test	Conventional N	Conventional % Passing On First Trial	Totally Peer-Instructed N	Totally Peer-Instructed % Passing On First Trial	Sig.
MODULE 7					
Decrypt	23	78.3	25	96.0	
Encrypt	23	60.9	25	100.0	.001
MODULE 6					
Documents	No Data			100.0	
KG-13	23	39.1	25	92.0	.001
KW-26	23	21.7	25	80.0	.001
MODULE 5					
CCU	44	77.3	26	84.6	
CR	44	86.4	26	80.8	
CP	44	70.5	26	76.9	
CK	44	88.6	26	100.0	
PP	44	86.4	26	69.2	
TR	44	72.7	26	76.9	
TP	44	56.8	26	61.5	
Numbering Systems	No Data		26	76.9	
ASCII Code	No Data		26	100.0	
MODULE 4					
Hollerith	9	66.7	25	100.0	.01
Data/Send	28	35.7	25	36.0	
Data/Receive	(combined with Data/Send)		25	44.0	
MODULE 3					
Performance Eval	No Data		20	30.0	
MODULE 2					
Performance Eval	No Data		18	27.8	
MODULE 1					
Operating Signals	No Data		9	44.4	
Routing Indicators	No Data		8	12.5	
Msg Prep Single	No Data		3	66.7	
Msg Prep Multiple	No Data		3	33.3	
Msg Prep Book	No Data		3	00.0	

translated into the job context and were included as performance-taught and performance-tested subjects and, therefore, were not comparable.

In Modules 1, 2 and 3 the course content was changed as a result of a change in AF doctrine so, again, there were no baseline data that were comparable to the peer-instructed data. In addition, lack of instructor experience with the new system led to attrition in recording data, accounting for the low Ns in the peer-instructed group for Module 1. (Note that the Ns increased through Modules 2 and 3 and stabilized at Module 4.)[1]

With this unfortunate situation, we were concerned with whether or not we could get any information regarding the relative performance of baseline and peer-instructed students on those content areas covered in Modules 1, 2 and 3. Fortunately these content areas re-occurred during Module 5 as part of the Job Performance in "DSTE operations." Performance in Module 5 on "preparation of messages" (the Module 1, 2 and 3 content) was compared for the two groups. First-time pass rates are presented in Table 3. Note that all conventionally trained students in the sample failed on their first attempts to prepare messages (narrative and data). The peer-instructed students performed significantly better, two-thirds of them passing the first time on preparation of narrative messages and over one-half passing on preparation of data messages. The peer-instructed students had to reach a higher skill proficiency initially (a 100% criterion), while 60% was the criterion for the conventionally trained students. Since the same time had elapsed for both groups between initial skill acquisition and the Module 5 test, it appears that the higher skill proficiency attained initially by the peer-instructed students provided them with better skill retention.

Overall, performance (Table 2) of the peer-instructed students was equal to or better than that of the baseline group. Peer-instructed students also appeared to retain better (Table 3).

Instructor Attitudes

Overall, instructors were doubtful or negative about the system--a few were positive and supportive. As a rule, they did not get

[1]Again, record-keeping forms and procedures were not used initially by course staff. When data gaps appeared and additional guidance was provided, record-keeping gradually improved.

TABLE 3. CONSTRUCTED COMPARISON OF PERFORMANCE OF MODULE 1, 2 AND 3 SKILLS BY CONVENTIONAL AND PEER-INSTRUCTED STUDENTS

Test	First-Trial Performance	Conventional N	Conventional %	Totally Peer-Instructed N	Totally Peer-Instructed %	χ^2	*df*	Sig.
Prepare Narrative Messages	Pass	0	0.0	19	67.9	24.08	1	.001
	Fail	22	100.0	9	32.1			
Prepare Data Messages	Pass	0	0.0	16	57.1	18.49	1	.001
	Fail	22	100.0	12	42.9			

involved in the project until they had to; some avoided orientations and "rap" sessions. The instructors seemed to have trouble "getting off the platform," were worried about their roles, their status and the quality of course output. They started out negative and they ended up that way, in spite of efforts to make the transition into the new system as smooth and easy as possible.

Data on opinions of the 12 instructors who had taken both the pre- and post-peer instruction questionnaires are presented in Table 4.

On student motivation, while there was a range of instructor opinion prior to experience with the system, there was a shift toward the negative on the post questionnaire.

A significant change of opinion took place on the matter of time being wasted. Time was indeed wasted as acceleration was not allowed under the constraint to follow the basic, un-modified model, under-staffing caused delays in testing and slack time was not used to advantage (*i.e.*, for enrichment training).

Instructors also displayed a significant negative shift regarding their own level of motivation. The newness of the program and their roles in it, and management problems (largely due to fluctuating inputs) are likely causes of this reduced motivation.

While the instructors indicated they felt practically no control over the course product, they, in fact, had primary control (as evaluators through quality control) but had failed to recognize the potentials and benefits of their new roles.

Student Attitudes

A comparison was made of the results of the Student Opinion Survey II, administered at the end of the course to conventionally-trained students (baseline) and to peer-instructed students. Table 5 presents some of the comparative student opinion data.

The peer-instructed students reported significantly more often than the conventional students that they had more skill practice time, had less trouble staying awake in class, had less trouble with their attention wandering in class, that their tests reflected their performance abilities rather than their ability to memorize information and that they had practiced the skills enough to become proficient.

On most other dimensions, the conventional and the peer-instructed groups had similar opinions --they liked being in the course, knew what the objectives were and felt able to perform their job skills--as they perceived them.

TABLE 4. CHANGE OF INSTRUCTOR OPINIONS AFTER INTRODUCTION OF PEER INSTRUCTION

Paraphrased Item	Opinion Changes: Change toward agreement	Change toward disagreement	No Change	p*
DELIVERY SYSTEM				
Student motivation up	1	7	4 (3 no;1 yes)	.070
Time is wasted	8	0	4 (3 yes;1 no)	.008
Cooperation better than competition	1	6	4 (3 yes;1 undecided)	.124
Students should have practice time	1	5	6 (5 yes;1 no)	.218
Practice better than lecture	2	3	5 (2 yes;2 no)	1.000
COURSE MANAGEMENT				
Student control problem	6	3	3 (3 yes)	.508
Instructor motivation up	0	6	6 (1 yes;5 no)	.032
Facilities used efficiently	5	5	2 (1 yes;1 no)	1.000
Instructors work harder	4	3	5 (1 yes;4 no)	1.000
Instructor prestige threatened	4	1	6 (3 yes;3 no)	.376
Instructor control over product	0	9	3 (2 yes;1 no)	.004
COURSE PRODUCT				
Student learn required skills	1	5	5 (4 yes; 1 undecided)	.218

*Two-tailed sign test

Particular note should be made of the data on student opinions of their motivation. While the instructors had expressed the opinion that the motivation of peer-instructed students was significantly down following peer instruction, the students' opinions were significantly more positive than the conventional group regarding having less trouble staying awake in class and having less trouble with their attention wandering.

Table 6 presents peer-instructed students' opinions of some basic aspects of peer instruction. These items did not appear on the questionnaire administered to the conventionally trained students, since they did not experience peer instruction and had no basis for response. Clearly, the students were favorable toward peer instruction. As we have found in the past, student comments that "When I really learned it is when I had to teach it" were common.

TABLE 5. STUDENT OPINIONS: PRE-AND POST-INTRODUCTION OF PEER INSTRUCTION

	Responses						*df*	χ^2	Sig.
	Conventional (N=27-29)			Peer (N=24-26)					
	+	Neutral	-	+	Neutral	-			
DELIVERY SYSTEM									
Skill practice time was sufficient	7	15	7	17	9	0	2	12.540	.01
Instructional objectives were clear	10	19	0	10	16	0	2	0.092	-
Tests indicated skill proficiency	18	8	3	22	3	1	2	3.520	-
Opportunity for feedback on skills	17	11	1	18	7	0	2	1.630	-
MOTIVATION									
Boredom seldom a problem	7	18	4	8	13	5	2	0.823	-
Liked being in the course	16	13	0	19	7	0	2	1.897	-
Material learned was interesting	18	11	0	21	5	0	2	2.322	-
Interest in career field has increased	21	8	0	16	10	0	2	0.734	-
Can stay awake in class	7	17	5	15	10	1	2	7.249	.05
Attention did not wander	7	18	4	12	13	0	2	5.858	.05
PROFICIENCY									
Feel able to perform job skills	14	14	1	13	12	0	2	0.900	-
Tests reflected performance not memory	5	9	14	16	3	5	2	12.793	.01
Practiced enough to become proficient	4	16	7	14	11	1	2	10.967	.01

TABLE 6. STUDENT OPINIONS: PEER INSTRUCTION

Paraphrased Item	Responses Peer-Instructed Students Only (N=25-26)		
	Favorable	Neutral	Unfavorable
Being taught by a peer	23	3	0
Teaching a peer	20	4	2
Teaching increased my confidence	22	4	0
100% criterion motivated me	17	9	0
Knowing test errors helped me	19	7	0
Test, re-test is a good idea	21	0	4

II. FIELD FOLLOW-UP OF PEER INSTRUCTION GRADUATES

PURPOSE

The purpose of the field follow-up was to provide an early field assessment of the peer-instructional training program and an empirical basis for Air Force decision-making regarding the implementation of this instructional system in the technical training establishment.

The first phase of the ongoing contract focused on (1) the mechanics and procedures involved in the course conversion; (2) feasibility of conversion and operational aspects; and (3) comparative performance of conventionally trained vs. peer-instructed students as measured in the school setting. The follow-up extended the scope of the study to determine the impact of the instructional innovations introduced into the course on incumbents' initial job proficiency, motivation and attitudes.

DATA COLLECTION PROCEDURES

As of 16 October 1975, the peer-instructional system was completely phased into the Communications Center Specialist course conducted at Sheppard AFB. Class 750930 and those entering subsequently received all of their training via the peer instruction method. Due to fluctuating student input, five classes were needed to attain the N of 50 totally peer-instructed graduates for the field follow-up. These graduates were interviewed at graduation and then tracked by name to their unit assignments for subsequent survey and interview contact with them and their first-line supervisors.

End-of-Course Interviews

An open-ended survey/interview of each graduate was conducted at the end of the course by the two NCOs assigned to the project. Six questions were posed dealing with the student's attitude toward the job, expectations regarding up-grade training and opinions about the Comm Center Specialist Course.

An additional two questions were answered by the Module 6 and 7 instructors (most recently in contact with students at the end of their technical training) regarding their estimates of each graduate's ability to do the job in the field and complete his up-grade training.

A copy of this survey (AF Survey Control #76-145C) is presented as Appendix A.

PRECEDING PAGE BLANK-NOT FILMED

Mail Surveys

Survey instruments were developed to be sent via mail to each of the 50 peer-instructed graduates and his supervisor. Each survey had an explanatory cover letter and a Privacy Act statement as required by AFR 12-35. There was some response to 96% of the surveys. For various reasons (*e.g.*, personnel attrition, incorrect assignment information) only 76% of the surveys were completed sufficiently for use in the data pool.

The incumbents' survey (AF Survey Control #76-145A) asked for an indication of the incumbent's feeling of initial job proficiency in each of the 19 major job task areas he was taught in the Comm Center Specialist Course; degree of difficulty experienced in meeting up-grade training requirements; attitudes about the job, co-workers, the Air Force and up-grade training; and advantages/disadvantages of peer instruction related to his job experience. A copy of this survey is presented as Appendix B.

The supervisors' survey (AF Survey Control #76-145B) could be completed anonymously and asked for the supervisor's opinion of the incumbent's initial job proficiency (in the 19 job task areas); the amount of supervision needed by the incumbent initially and at present; the incumbent's attitudes about the job, co-workers, the Air Force and up-grade training; and, if the supervisor had observed or supervised Comm Center Specialists prior to the introduction of the peer instruction program, he was asked to compare previous graduates with the peer-instructed graduate on the basis of job performance, amount of supervision required and attitudes. A copy of this survey is presented as Appendix C.

Structured Interviews

In order to obtain more in-depth information than could be gathered with a mail survey, sites to which the greatest numbers of peer-instructed graduates were assigned were selected for visits of the research staff. Contrary to predictions and expectations, it was found that 60% of the 50 peer-instructed graduates had been assigned to overseas units. Six overseas sites and four CONUS sites were selected and 21 incumbents and their supervisors were interviewed.

Incumbents and supervisors were interviewed in private and separately. Interview questions sought information parallel to that covered by the mail surveys (job, up-grade training, attitudes, etc.) but in more detail. The personal contact also allowed more flexibility within the lines of questioning and, being oral and private, fostered more candor in responses. In some cases, incumbents had had more than one supervisor since being assigned to the

unit. Every effort was made to contact and interview all of these supervisors. In other instances, incumbents had been working in a job other than that of Comm Center Specialist while waiting for special clearance or a job "slot." These individuals were, however, required to complete the up-grade training requirements for a 5-level 291 and they and their supervisors were interviewed on this basis.

Copies of the general guideline questions used by the interviewers are presented as Appendix D.

FINDINGS

End-of-Course Survey

The types and frequencies of responses to the questions answered by students and instructors are presented in Appendix A. A summary follows. All but three of the 43 graduates surveyed were satisfied with their career field and felt confident about their ability to do the job (items 1 and 2). Most of the graduates had a fairly good idea of what was expected of them on the job (item 3). All but one were favorable in their comments about the Comm Center Specialist course and the peer instruction (item 6) and all of the 43 felt that they would have no problems with up-grade training (item 5). Career intentions were undecided for 60% of the graduates at that time.

Instructor responses to items 7 and 8 indicate generally positive expectations/predictions about how these peer-instructed graduates would do on the job and in their up-grade training.

Mail Surveys

The common element of the incumbent and supervisor mail surveys is the first item, which is related to incumbents' and supervisors' ratings of incumbents' initial job proficiency level on each of the Comm Center Specialist major job tasks. Findings on this common item will be presented first, with additional incumbent or supervisor items following.

Job proficiency level. Respondents were given the option of rating initial job proficiency on four levels:

Column A - "Needed no help to do this task"
Column B - "Needed some help to do this task"
Column C - "Needed a lot of help to do this task"
Column D - "Could not do this task"

An additional option was Column E - "Task not required at this duty station," intended to prevent confusion between responses of "could not do" and "is not required to do" a particular task. Since there were large numbers of entries in this column on several of the job tasks, these data will be addressed separately.

Column E - "Task not required at this duty station"

Table 7 presents the frequencies of responses of individual supervisors and incumbents in Column E. As group data, the high frequency of reported non-requirement of some tasks (*e.g.*, tasks numbered 5, 6d, 7 and 8) raised some question regarding the necessity for including these tasks in the technical training course. However, some discrepancies between the frequencies of responses of supervisors and incumbents in Column E were noted and a comparison was made of paired responses to determine what degree of disagreement/agreement there was between each of the incumbents and their supervisors about whether or not that task actually is required at their duty station. Table 8 presents that comparison. With the amount of agreement between supervisors and incumbents on whether or not a task is required at their duty stations, tasks 6d and 7 do seem to be of questionable value for school training.

Columns A-D - Levels of job proficiency

Table 9 presents frequencies of supervisor and incumbent responses in Columns A-D on incumbents' initial job proficiency.

It was necessary to make certain assumptions in order to interpret the ratings assigned to the levels of job proficiency. Needing no or only some help (Columns A and B) are regarded as positive and are assumed to represent "prepared." Needing a lot of help or not being able to do the task (Columns C and D) are regarded as below an acceptable level of preparedness. The rating frequencies for supervisors and incumbents were grouped according to these assumptions and categorized as "prepared" or "not prepared." Table 10 presents these grouped data. (Note that the varying Ns in Table 10 are due to entries made in the additional Column E.)

Except for task #13 ("Receive narrative messages"), incumbents consistently rated themselves as better prepared than their supervisors rated them. On task #15 ("Routing indicators") there was a significant difference between the ratings, supervisors rating incumbents less prepared than incumbents rated themselves. On all tasks except task #5 ("Operate KW-26") and task #19 ("Service messages"), the majority or supervisors rated the incumbents as "prepared." The majority of incumbents rated themselves as "prepared" on all tasks.

TABLE 7. FREQUENCIES OF INDIVIDUAL SUPERVISOR AND INCUMBENT RESPONSES IN COLUMN E, "TASK NOT REQUIRED AT THIS DUTY STATION"

Task	Supervisors	Incumbents
1. Decrypt off-line	16	15
2. Encrypt off-line	15	15
3. Security documents/ procedures	4	2
4. Operate KG-13	9	8
5. Operate KW-26	22	16
6. DSTE equipment:		
a. Common Control Unit	14	12
b. Card Reader	17	15
c. Card Punch	16	10
d. Control Keyboard	27	26
e. Page Printer	13	13
f. Tape Reader	18	16
g. Tape Punch	17	16
7. Utilize binary/hexa-decimal numbering	28	21
8. Utilize ASCII code	25	12
9. Utilize Hollerith code	12	10
10. Send data msgs	10	8
11. Rec. data msgs	10	8
12. Send narrative msgs	1	3
13. Receive narrative msgs	1	3
14. Operating signals	1	2
15. Routing indicators	2	2
16. Single address msgs	3	5
17. Multiple address msgs	3	5
18. Book msgs	5	7
19. Service msgs	2	3

TABLE 8. FREQUENCIES OF SUPERVISOR-INCUMBENT PAIRED RESPONSES IN COLUMN E, "TASK NOT REQUIRED AT THIS DUTY STATION"[1]

Task	Number of Pairs Agreeing that Task NOT Required	Number of Additional Pairs with One Member Saying Task Not Required	Number of Pairs Agreeing that Task IS Required
1. Decrypt off-line	13	5	20
2. Encrypt off-line	13	4	21
3. Security documents/ procedures	2	1	32
4. Operate KG-13	7	2	28
5. Operate KW-26	14	9	14
6. DSTE equipment:			
a. Common Control Unit	11	2	24
b. Card Reader	13	0	21
c. Card Punch	13	0	20
d. Control Keyboard	19	6	5
e. Page Printer	9	2	23
f. Tape Reader	12	4	18
g. Tape Punch	11	4	18
7. Utilize binary/hexadecimal numbering	20	9	6
8. Utilize ASCII code	11	12	13
9. Utilize Hollerith code	8	4	24
10. Send data msgs	7	3	26
11. Rec. data msgs	7	3	26
12. Send narrative msgs	1	2	34
13. Receive narrative msgs	1	2	33
14. Operating signals	1	1	36
15. Routing indicators	1	2	35
16. Single address msgs	1	6	31
17. Multiple address msgs	2	4	32
18. Book msgs	3	6	29
19. Service msgs	1	3	34

[1]Total number of pairs = 38. Where one member of the pair did not respond to the item, the response of the other member of the pair was dropped. Data presented are for pairs in which responses were available for both members.

TABLE 9. FREQUENCIES OF SUPERVISOR & INCUMBENTS RATINGS OF JOB PROFICIENCY LEVEL (Columns A-D)

	A		B		C		D	
	Needed NO HELP to do this task		Needed SOME HELP to do this task		Needed A LOT OF HELP to do this task		Could NOT DO this task	
Task	Sup.	Inc.	Sup.	Inc.	Sup.	Inc.	Sup.	Inc.
1. Decrypt off-line	1	3	15	17	3	2	3	1
2. Encrypt off-line	1	4	15	16	3	2	4	1
3. Security documents/ procedures	5	9	19	18	4	6	5	2
4. Operate KG-13	7	12	14	13	5	4	3	-
5. Operate KW-26	2	9	6	7	3	4	5	1
6. DSTE equipment:								
a. Common Control Unit	9	14	12	10	3	1	-	-
b. Card Reader	10	11	9	10	2	1	-	-
c. Card Punch	9	12	9	7	2	1	1	1
d. Control Keyboard	1	5	4	4	1	1	2	1
e. Page Printer	13	15	10	9	1	-	-	-
f. Tape Reader	11	11	8	9	1	-	-	1
g. Tape Punch	10	11	8	8	2	1	1	1
7. Utilize binary/hexa-decimal numbering	2	5	4	6	1	3	1	1
8. Utilize ASCII code	3	10	8	12	2	4	-	-
9. Utilize Hollerith code	6	14	15	11	3	-	1	1
10. Send data msgs	11	14	14	11	3	2	-	1
11. Rec. data msgs	8	13	16	9	4	5	-	-
12. Send narrative msgs	12	16	21	17	3	1	1	-
13. Receive narrative msgs	13	14	20	16	3	3	-	-
14. Operating signals	6	12	18	16	10	7	3	1
15. Routing indicators	12	20	14	14	6	2	3	-
16. Single address msgs	6	16	20	12	7	4	2	1
17. Multiple address msgs	5	13	20	14	8	4	2	1
18. Book msgs	2	14	20	12	9	4	2	1
19. Service msgs	2	1	12	20	14	9	8	6

TABLE 10. SUPERVISOR AND INCUMBENT RATINGS OF INCUMBENTS' INITIAL JOB PROFICIENCY LEVEL

Task	Prepared (Columns A & B) Sup	Inc	Not Prepared (Columns C & D) Sup	Inc	χ^2
1. Decrypt off-line	16	20	6	3	1.423
2. Encrypt off-line	16	20	7	3	2.044
3. Security documents/ procedures	24	27	9	8	0.177
4. Operate KG-13	21	25	8	4	1.681
5. Operate KW-26	8	16	8	5	2.733
6. DSTE equipment:					
a. Common Control Unit	21	24	3	1	1.180
b. Card Reader	19	21	2	1	0.410
c. Card Punch	18	19	3	2	0.227
d. Control Keyboard	5	9	3	2	0.891
e. Page Printer	23	24	1	0	1.021
f. Tape Reader	19	20	1	1	0.001
g. Tape Punch	18	19	3	2	0.227
7. Utilize binary/hexa-decimal numbering	6	11	2	4	0.008
8. Utilize ASCII code	11	22	2	4	0.000
9. Utilize Hollerith code	21	25	4	1	2.129
10. Send data msgs	25	25	3	3	0.000
11. Rec. data msgs	24	22	4	5	0.180
12. Send narrative msgs	33	33	4	1	1.676
13. Receive narrative msgs	33	30	3	3	0.012
14. Operating signals	24	28	13	8	1.485
15. Routing indicators	26	34	9	2	5.508 *
16. Single address msgs	26	28	9	5	1.159
17. Multiple address msgs	25	27	10	5	1.612
18. Book msgs	22	26	11	5	2.523
19. Service msgs	14	21	22	15	2.724

* Indicates disagreement - supervisors rating incumbents as significantly less prepared than did incumbent self-ratings ($p < .02$).

Additional incumbent mail survey items. Table 11 presents item response frequencies on additional incumbent survey items. The majority of incumbents reported that they had only a little or almost no difficulty in completing their CDC and skill proficiency requirements for their up-grade training and in adjusting to CDC materials after having experienced peer instruction.

Incumbent attitudes about their jobs, their co-workers, the Air Force in general and the up-grade training process were generally positive or enthusiastic. Career intentions at that time remained tentative for most incumbents.

Based on their subsequent job experience, incumbents were asked (in the last two items of the survey) to comment on the advantages or disadvantages of peer instruction relative to their job preparation. Table 12 presents a compilation of these comments. Nineteen of the 37 incumbents responding felt they had learned the basics of the job in Tech School and 11 of them reported that Tech School did not pertain to their assigned jobs. This figure could be inflated due to the number of incumbents in highly specialized jobs and those still awaiting duty in a Comm Center.

Additional supervisor mail survey items. The supervisors were asked to rate the amount of supervision required by their incumbents initially and at the time of the mail survey (four to five months later) on doing assigned job tasks, completing CDC materials and completing skill proficiency requirements. These items and the response frequencies are presented in Table 13. Incumbents subsequently required significantly less supervision than they had required initially in doing assigned job tasks ($\chi^2 = 16.942$; $p < .001$).

At the time of the mail survey, supervisor ratings of incumbents' attitudes toward the job, co-workers, the Air Force in general and up-grade training were similar to the incumbent self-ratings that were reported in Table 11 ($r = .492$; significant at the .001 level). Incumbents' career intentions at that time were just as unclear to the supervisors as they were to incumbents.

The remaining supervisor survey items and response frequencies are presented in Table 14. Unfortunately, 45% of the supervisors had not supervised 3-level Comm Center Specialist prior to the introduction of peer instruction in Tech School (17 out of 38 marking the "N/A" item). Of the 21 who had been supervisors prior to peer instruction, nine rated the peer-instructed incumbents better than previous Tech School graduates in job performance: seven rated them better in requiring less supervision; and eight rated them higher in attitudes. Only

TABLE 11. ADDITIONAL INCUMBENT MAIL SURVEY ITEMS & RESPONSE FREQUENCIES

How much difficulty have you had with your upgrade training in: (N=38)	Almost NO difficulty	A LITTLE difficulty	A LOT OF difficulty	Almost CAN'T DO IT
1. Completing CDC materials	26	8	3	1
2. Completing OJT proficiency requirements	25	11	2	-
3. Adjusting to a correspondence course to get training instead of receive instruction via a peer instructor	18	14	5	1

What have been your feelings/attitudes about: (N=37)[1]	Strongly positive (enthusiastic)	Generally positive (must OK)	Indifferent-(I have little interest	Negative
1. Your job	13	20	3	1
2. Your co-workers	23	12	2	-
3. The Air Force in general	11	20	6	-
4. The Air Force as a career	5	13	13	6
5. The upgrade training process	14	17	4	2

Based on your experience on the job, what do you think were the advantages or disadvantages of peer instruction (in your Course at Sheppard) in teaching you Comm Center Specialist skills? See Table 12.

In the space below we would like you to write any comments you might have regarding your Tech School training experience, your job, or any other related items that may not have been covered above.

Comments: See Table 12.

[1] One incumbent failed to respond to this item. However, since he was one of the "interview" incumbents, the rest of his responses were retained in the data pool.

TABLE 12. INCUMBENT COMMENTS REGARDING ADVANTAGES/ DISADVANTAGES OF PEER INSTRUCTION
N=37

Comment	Frequency of Statement
Learned basics	19
Teaching assured learning or retention	11
Tech Sch content did not pertain to this job (or job I'm assigned)	9
Need more participation/support from TI	6
Could have used some lecture to cover fine points or "ideas"	4
Some things taught in too little time	4
CDC not related to this job (or job I'm assigned)	4
PI allowed us to ask as many questions as needed	3
Could work at own speed	3
Students can't teach you what you need	3
Should be self-paced (between Mods)	3
Testing was lax - "I knew I shouldn't have passed"	2
Teaches only to the test	2
Typing classes inadequate/weak point	2
Wanted extension of Tech Sch	2
Need special classes for specialized assignments	2
Delay in assignment hurt my 291 skills	2
3-level 291 should not be sent here	1
Too much information covered for special assignments	1

TABLE 13. ADDITIONAL SUPERVISOR MAIL SURVEY ITEMS & RESPONSE FREQUENCIES (N = 38)

	Needed NO supervision	Needed a LITTLE supervision	Needed an AVERAGE amount of supervision	Needed A LOT OF supervision	Can't rate
How much supervision did this airman require when he or she first started out in:					
1. Doing assigned job tasks	1	11	14	10	2
2. Completing CDC knowledge requirements (CREs, VREs and CE)	10	9	11	4	4
3. Completing OJT proficiency requirements (JPGs)	6	9	17	4	2
How much supervision does this airman require now in:					
1. Doing assigned job tasks	9	19	9	1	-
2. Completing CDC knowledge requirements (CREs, VREs and CE)	16	11	7	3	1
3. Completing OJT proficiency requirements (JPGs)	11	16	10	1	-

	Strongly positive (enthusiastic)	Generally positive (just OK)	Indifferent (shows little interest)	Negative	Can't rate
What is this airman's attitude toward:					
1. The job	16	18	3	-	1
2. Co-workers	28	10	-	-	-
3. The Air Force in general	10	24	1	1	2
4. The Air Force as a career	5	13	9	3	8
5. The upgrade training process	11	19	4	1	3

TABLE 14. FINAL SUPERVISOR MAIL SURVEY ITEMS AND RESPONSE FREQUENCIES
N=38

If you were a line supervisor in this career ladder before May 1975, we would like you to recall the 3-level 291s who came under your supervision as Tech School Graduates and compare this airman with those previous 291s in regard to his job performance, amount of supervision required and attitudes.

If you were not a line supervisor before May 1975, mark "N/A" here: 17.

How does this airman "stack up" against earlier 291 graduates you have supervised? Please comment regarding:

N=21

Job performance

Above average	9
Average	9
Below average	3

Amount of supervision required

Above average	4
Average	10
Below average	7

Attitudes

Above average	8
Average	10
Below average	3

three peer-instructed incumbents were rated below the average previous Tech School graduates in job performance and attitude and four required more than an average amount of supervision.

Structured Interviews

As there were few simple Yes/No responses in the interviews, responses and their explanatory comments (offered by the respondents) will be presented here in text rather than tabular form. (Refer to Appendix D for exact item content.) Interviewees did not necessarily respond to all questions. There were 21 incumbents and their supervisors interviewed. Their responses are summarized in the following sections.

Incumbents' responses regarding the job (items 1, 2, 4, and 11). Nine of the incumbents said that the job was not what they had expected because: a) there was more paper work than expected; b) equipment was different; and c) procedures were different. For the other 12 incumbents, the job was what they expected or "pretty much" so.

Eight of the incumbents reported that they had been assigned tasks they had not been trained properly to do, primarily because of different equipment or different procedures. A need for more security training was expressed by two incumbents. One incumbent felt he needed more task practice.

Rating themselves on job performance, 18 incumbents felt they were doing the job from "average" to "very good." Two incumbents said their job performance was "below average" because of personal problems and delay in getting to the Comm Center (one of these was assigned to switchboard for three months and "forgot a lot").

None of the incumbents reported dissatisfaction with his job assignment. Only five said they were "somewhat" satisfied; the remainder were satisfied without qualification.

Incumbents' responses regarding their Tech School training (items 3, 8, 12 and 13). One of the incumbents felt he had been overtrained for the job; six said they should have been trained on other equipment or procedures in order to do their jobs properly. The remainder liked Tech School and felt it had prepared them for the job--particularly in the basic fundamentals.

Most of the incumbents felt that their Tech School training experience had prepared them to complete their up-grade training requirements. One incumbent said that workbooks in Tech School would have helped him and another, again, reported that equipment differences (between School and the job) had caused problems for him.

In retrospect, 17 of the incumbents said that they would prefer peer instruction to any other approach if they "had it (Tech School) to do over again." They cited their reasons as: The one-to-one ratio, "you learn by teaching," it is "hands-on," less boring, gives insight to the job and there is no homework. The four other incumbents felt that conventional methods teach better and that lecture, theory and workbooks were needed.

Several items were cited as suggested improvements in the Tech School course. The most frequently mentioned (cited by eight incumbents) item was "More participation by the Technical Instructors." Some need for orientation and review "lectures" was cited by five incumbents.

Incumbents' responses regarding their up-grade training (item 5). There were four incumbents who reported having difficulty with their up-grade training. All four said that the written portion, or Career Development Course (CDC) materials, were a problem and one of the four also reported problems with the skill proficiency requirement (primarily, typing).

At each of the sites visited for the follow-up interviews, data were collected from incumbents' training records to determine their progress in up-grade training. All but the four incumbents mentioned above had completed their CDC requirements (volumes 1, 2 and 3) and one of these four was scheduled to complete his volume 3 requirement the week following the interview. Six incumbents had taken their End-of-Course test; five had passed and the sixth was awaiting receipt of his score.

The incumbents were progressing toward completion of their requirements on schedule. The one exception was the incumbent with the severe typing problem. Although he was achieving well on the CDC requirements, it was not expected that he would ever meet the typing skill proficiency requirements.

Comments regarding up-grade training were: study is boring; reading is a problem; language is a problem; working on one job and studying another[1]; and typing is difficult.

---

[1]For several incumbents this was the case--either because of highly specialized work (such as a mobile unit) or delays in getting into Comm Center activities (waiting for clearances, etc.). Since these people were still in the career field, they were studying for the 5-level in 291 but working in another (either specialized or related) field.

Incumbents' responses comparing peer instruction, up-grade training and other approaches (items 6 and 7). Nineteen of the incumbents stated a preference for peer instruction as opposed to other methods because: it is performance-oriented; it is more interesting; it is easier; and the one-to-one ratio is good.

One incumbent preferred the CDC because he could "get a handle on the written stuff;" the other incumbent had more confidence in conventional instruction.

As far as job requirements were concerned, 17 incumbents reported that peer instruction prepared them better because of the performance-orientation, ability to ask questions, development of confidence, provision of background. Again, one favored CDC, one conventional and the other two thought a combination of methods prepared them well.

Incumbents' responses regarding their attitudes and their career intentions (items 9 and 10). The incumbents generally reported their attitudes toward their duty assignments, their supervisors, their co-workers and the Air Force in general as "OK" to "very good." Poor attitudes were reported by four toward the duty assignment, two toward their supervisors and two toward the Air Force.

Intentions (at the time of the interview) to make the Air Force a career were compared to incumbents' reported career intentions at the end of the course. Of the 20 incumbents for whom complete data were available, ten remained unchanged in their intentions (two for career, three against and five undecided); seven made negative shifts (one from "career" to undecided and six from undecided to "no"); three made positive shifts (one from "no" to undecided and two from undecided to "yes").

Supervisors' responses regarding their impressions of Tech School graduates (items 1 and 7). Overall (and not necessarily in reference to the peer-instructed graduates), eight of the supervisors said that Tech School is advantageous and does a good job preparing Comm Center Specialists. Other individuals had varying comments such as "Tech School is a waste of time and money," "Not much difference between Tech School and direct duty assignment," and comments regarding equipment mismatches, need for OJT and individual motivation.

Speaking specifically about the peer-instructed graduates, six supervisors reported that their incumbents exceeded their expectations of a new Tech School graduate, 11 met supervisors' expectations and one did not (due to attitude and estimated lack of potential).

Supervisors' responses regarding incumbent job performance (items 2, 5 and 6). Sixteen of the supervisors reported that their incumbents were qualified for the job when they arrived at their duty stations. Six said that their incumbents were not prepared or had some limitations (because of equipment and procedure differences and need for training in routing messages, NADPS, continuity of communications operations, service messages, typing and crypto).

Thirteen supervisors said that their incumbents could perform all expected job duties; three said they could not. Problems cited were: different equipment and procedures (3), poor typing (4), poor tape reading (2), crypto (4), service messages (3), accounting (1) formats (2), and security (1). Supervisors reported having to provide special training in these areas to get incumbents' skills up to a level satisfactory for local requirements.[1]

Supervisors' comparisons of peer-instructed incumbents vs previous Tech School graduates (items 3, 4 and 16). Supervisors rated their incumbents as average (3), good (4) or superior (10) in comparison to other Tech School graduates. They reported that the peer-instructed graduates were ahead of or better than previous graduates on completion of up-grade training (7), or were comparable (6). Thirteen of the incumbents were rated as requiring less supervision, while only one reportedly required more (others were at intervening levels). In performing tasks, 11 incumbents were rated as better than previous graduates and four were rated as much better. None was rated as average or below. Comparative attitudes were rated as very good (11), good (3), OK or average (2) and poor (3). Additional comments reported high motivation and initiative on the part of the peer-instructed graduates.

Of the 11 supervisors who reported that their incumbents' experiences with up-grade training were different from those of previous Tech School graduates, nine said it was different because the peer-instructed graduates progressed faster, better or with less difficulty. The other two comments were not related to incumbent performance.

Supervisors' responses regarding the need for theory of communications (items 8, 9, 10, 11, 12 and 13). Seventeen of the

---

[1] At the time of the site visit in July, one incumbent was typing at six wpm, after five months of on-the-job remedial typing (daily). This incumbent reported that he could not type and did not meet the graduation criterion in typing during the course.

supervisors said that their incumbents had sufficient background in theory (three said no, one said partly). Seven of these supervisors said that theory was not needed at the 3-level and eight said that theory could be picked up later. None of the supervisors felt that the incumbents would be hampered because of a lack of theory.

Three of the supervisors felt that knowledge of theory was critical at all skill levels (especially in security), one felt that it didn't make much difference because of constant changes, and the rest agreed that theoretical knowledge is critical at or beyond the 5-level.

Sixteen supervisors said that theory is taught best on-the-job with discussions and applications. One felt that it should be taught in Tech School and one felt it should be taught through the 5-level CDC.

As supervisors, a need for theory in their jobs was reported by 15. Three said that they didn't need any theory and one said that it comes with experience.

Supervisors' responses regarding incumbents' progress in up-grade training (items 14, 15 and 17). Most supervisors rated their incumbents as being ahead of schedule (8) or on schedule (10). Only three were reportedly behind schedule and one was being considered for cross-training or elimination.[1]

Only three incumbents were reported as having difficulty with the CDC materials. One of these had a language problem (ESL), one had a problem deciphering the material and the third simply did not like to study. The rest of the incumbents were not experiencing difficulties with the material.

All incumbents were reported as progressing well with the skill proficiency requirements of up-grade training (except the typing problem for the one incumbent noted earlier). One incumbent needed extra help in services, and one needed help in off-line crypto.

Supervisors' responses regarding supervision of incumbents (items 18, 19 and 20). The supervisors being interviewed reported that when their incumbents arrived at the duty station they required

[1] This one was the incumbent who could not type.

very little or no supervision (10), a little supervision (7), or an average amount of supervision (3). Only one required more than an average amount.

Only one incumbent was reported as being a disciplinary problem because he was occasionally late for work. One other was reported as lacking in motivation. The other 19 were reported as "no problems."

Twenty of the incumbents were reported as having high to very high motivation. The low motivation incumbent was having personal problems.

Supervisors' estimates of incumbents' career intentions (item 21). *Supervisors* estimated their incumbents' career intentions as: yes (5), no (8), maybe or don't know (8). These estimates were closely allied with the incumbents' intentions reported earlier.

III. DISCUSSION

As discussion of the findings accompanied presentation of the data in the previous sections, findings will not be re-discussed here. Rather, this section will be addressed to two major areas that emerged from the data as salient to consideration of continuation or expansion of the use of peer instruction in Air Force technical training. One area includes course content, instructor motivation and course management. Although this area is concerned with Air Force "in-house" issues, a few comments will be made here. The second area includes restrictions or limitations of the fixed-pace peer instruction model and options for modification/adaptation to meet Air Force operational realities.

"IN-HOUSE" ISSUES

Even though the 29130 course is intended to (and does) provide the basic fundamentals of communications skills, it is possible that some modification of content could be considered in order to avoid or correct the problem of the frequent report of equipment and procedure differences in the field. The ISD process is intended to prevent such discrepancies, but with the Air Force duty assignment system being as individualized as it is, some specialized training might be substituted for a portion of the existing course for students who are designated to go to certain types of communications operations. At one location visited, all incoming Comm Center people are required to complete a specialized two week training program before they can go to the Comm Center. At other locations, so few of the Tech School-taught skills are used that direct duty assignment of 29130 personnel would be preferred, according to on-site personnel. In addition, there were some overseas locations where it was reported that 3-level personnel should not be assigned because they do not have sufficient training or experience.

The frequency of reports from graduates that they wanted more participation on the part of Technical Instructors during the course is consistent with the findings reported following the course conversion to peer instruction. Instructor indifference/resistance was a constant problem that, according to the TRAB at Sheppard, was only beginning to diminish in early 1976 (nearly one year after the introduction of peer instruction). Instructors going through the conventional instructor training course are not prepared to work in a performance-oriented training and testing system. They are groomed as professional instructors to impart information following conventional methods and are--as professionals--granted a great deal of autonomy. The application of their professionalism in facilitative, supportive roles was apparently difficult for the instructors to

PRECEDING PAGE BLANK-NOT FILMED

comprehend. Their critical roles in the peer instruction system as evaluators, managers and quality control agents were not perceived by them as being important. However, the fixed-paced peer instruction model tends to foster peer interactions more than student/instructor interactions in the presentation of instruction. This tendency may account for student reports that they wanted more interaction with the instructors. It may also account for some of the instructors' feelings that they had been displaced from the instructional program.

If the instructors and course managers had undergone a formalized course of training in the techniques of student-centered, performance-oriented training and testing, many of the operation and management problems may have been alleviated and the shift away from more "conventional" techniques (instructor-centered, lecture-oriented, paper and pencil testing) may have generated less apprehension.

Closer adherence to the operation of the instructional system and model requirements would have prevented some problems and some dissatisfactions. The peer instruction model is a carefully constructed system based on established learning principles. Each phase of the model is designed for specific purposes. During the operation of the project, the Observation and Job Performance phases were often omitted, curtailed or conducted in a perfunctory manner. Several graduates stated that an orientation and a review would have helped them. A properly conducted Observation and Job Performance phase should, as part of its design, fulfill orientation and review needs. "Properly conducted" is meant to imply high-fidelity performance-based simulation, participation of the expert instructor (informal imparting of information, answering of questions, explanation of total system functions or "continuity," "war stories," etc.), quality control monitoring of the job performer and opportunity for the observing student to ask questions and get a "feel" for what he will be required to learn and why.

Other problems originated beyond the influence of the course and were dealt with fairly well by course personnel. The primary problem of this type was wide fluctuation of student input; administrative requirements and long holidays also fell into this category.

LIMITATIONS OF THE FIXED-PACE PEER INSTRUCTION MODEL

It cannot be said that the model itself--operating under certain constraints for the purposes of this project--did not contribute some problems of its own. The major problem was the restriction of full self-pacing with open access to and open exit from the course. The Air Force manpower system is well equipped to handle the open exit aspect of a self-paced course. Since fluctuating input seems to be a reality in the Air Force (as in the other services), modifications to or adaptations of the model need to be accomplished to allow for open entry and self-pacing. Similar modifications have been made and tested in other locations and have been successful in

reducing training time and costs, while retaining the benefits of peer instruction and producing graduates who are prepared to do their required jobs.[1]

The major differences between these modified programs and the fixed-pace peer instruction model are that, in the modified programs: mandatory peer instruction is reduced in time; fluctuating inputs are more readily accommodated by open access and open exit; and student rate of progress through the course is entirely individualized (self paced). An additional feature, which apparently would be beneficial, is that the adapted peer-instructional models do not rely as heavily on peer interactions as does the fixed-pace model, even though the Technical Instructors are still not the primary medium of instructional presentation.

A modified peer-instructional model, coupled with a formal program of re-education for managers and instructors would permit wider utilization of peer instruction in the Air Force as well as reducing time (and, therefore, costs) in the technical training base.

---

[1] "A Career-Oriented, Free-Flow, Peer-Instructional System," by Jacklyn E. Hungerland, HumRRO Professional Paper 6-73, June 1973.

Self-Paced Instruction in a Cognitively Oriented Skills Course: Supplyman, MOS 76Y10, by Jacklyn E. Hungerland and John E. Taylor.

Self-Pacing a Gross Motor Skills Course: Crawler Tractor Operator, MOS 62E20, by Mark F. Brennan and John E. Taylor, HumRRO Technical Report 75-19, June 1975.

The Development of an Open-Access, Performance Oriented Curriculum for Training the Military Policeman (MOS 95B20), by J. Richard Suchman, Albert L. Kubala, and John E. Taylor, June 1975.

The Implementation and Validation of a Performance-Oriented, Self Paced Basic Law Enforcement Course for the U.S. Army Military Police School (MOS 95B20), by J. Richard Suchman, Jacklyn Hungerland, and Wendy J. McGuire, HumRRO Final Report FR-WD(CA)-76-13, August 1976.

IV. CONCLUSIONS

PEER INSTRUCTION IN THE COMMUNICATIONS CENTER SPECIALIST COURSE

1. Peer instruction improved the quality of course output in that it imposed higher performance standards (100%) and focused on the mastery of job skills.

2. The peer-instructional system was sufficiently flexible to accommodate problems such as: a) uneven inputs; b) staff shortages; and c) instructor resistance.

3. Student performance and instructor evaluations of student performance in the course appeared to be satisfactory estimates of job proficiency and up-grade training progress in the field.

PEER-INSTRUCTED GRADUATES IN THE FIELD

Peer-instructed graduates:

1. Were prepared to do their jobs when they arrived at their duty stations.

2. Met or exceeded their supervisors' expectations of a new Tech School graduate.

3. Required an average amount or less than an average amount of supervision.

4. Were favorable toward peer instruction over other methods for learning their job skills.

5. Were highly motivated and positive in attitude.

6. Were completing their up-grade training on schedule with few difficulties.

7. Were satisfied with their job assignments.

PEER INSTRUCTION POTENTIAL IN THE AIR FORCE

1. To facilitate utilization of peer-instructional techniques in the Technical Schools, student-centered, performance-oriented instructional techniques should be developed and included in the Air Force instructor and training manager courses.

2. To receive the range of benefits possible from peer instruction, the specified instructional model must be followed carefully and monitored via an internal quality control system.

PRECEDING PAGE BLANK-NOT FILMED

3. The basic (fixed-pace) peer-instructional model can be adapted/modified to provide open access, open exit, full self-pacing with performance-oriented training and testing.

4. An adapted peer-instructional model can be used more widely in the Tech Training Base and in the field to provide improved job preparation of students (100% criterion), produce highly motivated students and reduce training time (and costs) through self-pacing.

APPENDICES

APPENDIX A

END-OF-COURSE SURVEY

STUDENTS NAME_____

CLASS NUMBER_____

ASSIGNMENT_____

REGULAR=40 ANG=2 RES=1 INCUMBENT N=43

1. How do you feel about your job in the Air Force?
   29 = Guaranteed job assignment or first choice and still like it
   11 = Not first choice or didn't like it at first, but like it now
    3 = Not happy with career field

2. Do you think you can do the job?
   40 = "Yes or "definitely" or "no doubt about it"
    2 = Unsure
    1 - No answer

3. What do you think is expected of you on the job?
   27 = Do what was taught in school
    6 = Process messages
    2 = Have general knowledge of Commo
    2 = Undecided
    2 = Cross-train
    1 = No answer
    3 = Misc. (weekend work, etc.)

4. What are your career intentions right now?
   12 = Planning on a career in AF
    5 = 4 years and out
   26 = Undecided

5. Do you think you will experience any problems during up-grade training? If yes, what?
   43 = No
    0 = Yes

6. Comments about the 3ABR29130 Course.
   42 = Favorable
    1 = Unfavorable

7. How do the instructors feel this student will do in the field?
   32 = Good to outstanding
    5 = Fair to average
    1 = Poor
    5 = No answer

8. How do the instructors feel the student will do in up-grade training?
   29 = Good to outstanding
    8 = Fair to average
    1 = Poor
    5 = No answer

PRECEDING PAGE BLANK-NOT FILMED

AF Survey Control #76-145A
Incumbents' Survey
AFTEC

APPENDIX B

To: Amn _____

The Human Resources Research Organization, under contract to the Air Force, is currently evaluating the value or effects of the peer-instructional system you had in the 291 course at Sheppard AFB in relation to your job performance and upgrade training.

The attached questionnaire is shorter than the one you completed at the end of the course at Sheppard, and should only take a few minutes to complete. Be sure to follow the directions for each section carefully. Once again, we ask that you answer the questions honestly and that your added comments really reflect your opinions or feelings. The information you provide will help us determine how well peer instruction helps to meet the needs of the new 291 in the field.

Mark your answers directly on the questionnaire pages.

When you have completed the questionnaire, place it in the attached envelope, seal it, and return the envelope to the person from whom you received the questionnaire (your supervisor or the Project Officer). Thank you.

- - - -

APPENDIX B

Name_____

AF Survey Control #76-145A
Incumbents' Survey
AFTEC

For each of the 29130 tasks listed in the left-hand column, rate your evaluation of (your) ability to perform at the time (you) began work in the Comm Center at this duty assignment. We are interested only in initial job proficiency, in order to assess the effectiveness of the 29130 training at Sheppard AFB.

For each task, place a check mark (✓) in one of the columns that best describes initial job proficiency level.

TASKS	A Needed NO HELP to do this task	B Needed SOME HELP to do this task	C Needed A LOT OF HELP to do this task	D Could NOT DO this task	E Task not required at this duty station
1. Decrypt off-line messages					
2. Encrypt off-line messages					
3. Utilize security documents and procedures					
4. Operate KG-13 on-line equipment					
5. Operate KW-26 on-line equipment					
6. Operate or utilize DSTE equipment:					
a. Common Control Unit					
b. Card Reader					
c. Card Punch					
d. Control Keyboard					
e. Page Printer					
f. Tape Reader					
g. Tape Punch					
7. Utilize binary & hexadecimal numbering systems					
8. Utilize ASCII code					
9. Utilize Hollerith code					
10. Send data messages					
11. Receive data messages					
12. Send narrative messages					
13. Receive narrative messages					
14. Determine operating signals					
15. Determine routing indicators					
16. Prepare single address messages					
17. Prepare multiple address messages					
18. Prepare book messages					
19. Process service messages					

APPENDIX B

AF Survey Control #76-145A
Incumbents' Survey
AFTEC

For each of the next three questions place a check mark ( ) in the one column that best describes your feelings from the time you began to work at this duty assignment.

	Almost NO difficulty	A LITTLE difficulty	A LOT OF difficulty	Almost CAN'T DO IT
How much difficulty have you had with your upgrade training in:				
1. Completing CDC materials				
2. Completing OJT proficiency requirements				
3. Adjusting to a correspondence course to get training instead of receive instruction via a peer instructor				

APPENDIX B

AF Survey Control #76-145A
Incumbents' Survey
AFTEC

What have been your feelings/ attitudes about:	Strongly positive (enthusiastic)	Generally positive (just OK)	Indifferent (I have little interest)	Negative
1. Your job				
2. Your co-workers				
3. The Air Force in general				
4. The Air Force as a career				
5. The upgrade training process				

Based on your experience on the job, what do you think were the advantages or disadvantages of peer instruction (in your Course at Sheppard) in teaching you Comm Center Specialist skills?

In the space below we would like you to write any comments you might have regarding your Tech School training experience, your job, or any other related items that may not have been covered above.

Comments:

APPENDIX C

AF Survey Control #76-145B
Supervisors' Survey
AFTEC

To the Supervisor of: Amn _____

During CY 75, the Human Resources Research Organization, under contract to the Air Force, conducted a study involving the use of peer instruction in the 29130 course at Sheppard AFB. We are currently conducting a field follow-up of 50 graduates from the peer-instructed course in relation to their job performance and upgrade training.

Enclosed you will find a brief questionnaire labelled with the name of one of those graduates you have supervised on the job. We ask that you — as the Airman's supervisor — complete the questionnaire as carefully and completely as possible. Your comments will be used for research purposes only, and will remain anonymous. The information you provide will help us determine how well peer instruction helps to meet the needs of the 291 in the field.

Please follow the directions for each section carefully and mark your answers directly on the questionnaire pages.

When you have completed the questionnaire, place it in the attached envelope, seal it, and return the envelope as instructed.

Each of the 50 Airman graduates has been asked to complete a similar questionnaire. A Project Officer or your Commander will give you instructions regarding the return of the completed questionnaires.

Thank you for your help.

— —

In accordance with paragraph 30, AFR 12-35, Air Force Privacy Act Program, the following information about this survey is provided:

a. Authorities

Title 10 USC, Section 8012, Secretary of the Air Force: Powers and Duties Delegation by; Executive Order 9397, 22 Nov 1943, Numbering System for Federal Accounts Relating to Individual Persons.

b. Principal Purpose

This survey is being conducted to obtain field follow-up evaluation data on the effectiveness of the Peer Instruction Course developed by the Human Resources Research Organization under contract to the Air Force at Sheppard Air Force Base, Texas.

c. Routine Use

The survey data will be analyzed to provide specific recommendations for course changes in the experimental course at Sheppard AFB. All data will be kept completely confidential.

d. Participation in this survey is entirely voluntary.

e. No adverse action of any kind may be taken against any individual who elects not to participate in this survey.

YOU MAY DETACH & RETAIN THIS STATEMENT IF DESIRED.

APPENDIX C

Airman's name _____ (Required)

Supervisor's name _____ (Optional)

AF Survey Control #76-145B
Supervisors' Survey
AFTEC

For each of the 29130 tasks listed in the left-hand column, rate your evaluation of (the incumbent's) ability to perform at the time (he or she) began work in the Comm Center at this duty assignment. We are interested only in initial job proficiency, in order to assess the effectiveness of the 29130 training at Sheppard AFB.

For each task, place a check mark (✓) in one of the columns that best describes initial job proficiency level.

TASKS	A Needed NO HELP to do this task	B Needed SOME HELP to do this task	C Needed A LOT OF HELP to do this task	D Could NOT DO this task	E Task not required at this duty station
1. Decrypt off-line messages					
2. Encrypt off-line messages					
3. Utilize security documents and procedures					
4. Operate KG-13 on-line equipment					
5. Operate KW-26 on-line equipment					
6. Operate or utilize DSTE equipment:					
a. Common Control Unit					
b. Card Reader					
c. Card Punch					
d. Control Keyboard					
e. Page Printer					
f. Tape Reader					
g. Tape Punch					
7. Utilize binary & hexadecimal numbering systems					
8. Utilize ASCII code					
9. Utilize Hollerith code					
10. Send data messages					
11. Receive data messages					
12. Send narrative messages					
13. Receive narrative messages					
14. Determine operating signals					
15. Determine routing indicators					
16. Prepare single address messages					
17. Prepare multiple address messages					
18. Prepare book messages					
19. Process service messages					

AF Survey Control #76-145B
Supervisors' Survey
AFTEC

APPENDIX C

For each of the next three questions, place a check mark (✓) in the one column that best describes your opinion of this airman.

	Needed NO supervision	Needed a LITTLE super-vision	Needed an AVERAGE amount of super-vision	Needed A LOT OF super-ision	Can't rate
How much supervision did this airman require when he or she first started out in: 1. Doing assigned job tasks					
2. Completing CDC knowledge requirements (CREs, VREs and CE)					
3. Completing OJT proficiency requirements (JPGs)					

	Needs NO supervision	Needs a LITTLE super-vision	Needs an AVERAGE amount of super-vision	Needs A LOT OF super-vision	Can't rate
How much supervision does this airman require <u>now</u> in: 1. Doing assigned job tasks					
2. Completing CDC knowledge requirements (CREs, VREs and CE)					
3. Completing OJT proficiency requirements (JPGs)					

APPENDIX C

AF Survey Control #76-145B
Supervisors' Survey
AFTEC

What is this airman's attitude toward:	Strongly positive (enthusiastic)	Generally positive (just OK)	Indifferent (shows little interest)	Negative	Can't rate
1. The job					
2. Co-workers					
3. The Air Force in general					
4. The Air Force as a career					
5. The upgrade training process					

If you were a line supervisor in this career ladder before May 1975, we would like you to recall the 3-level 291s who came under your supervision as Tech School Graduates and compare this airman with those previous 291s in regard to his job performance, amount of supervision required and attitudes.

If you were not a line supervisor before May 1975, mark "N/A" here:_____.

How does this airman "stack up" against earlier 291 graduates you have supervised? Please comment regarding:

Job performance

Amount of supervision required

Attitudes

PLACE _____

DATE _____

APPENDIX D

INCUMBENT INTERVIEW GUIDE

Incumbent Name: _____ Supervisor's Name: _____

EXPECTATIONS/TRAINING:

1. Has the 29130 duty assignment been what you expected after completing tech school? [Explain] _____

_____

2. Have you been assigned tasks that you felt you were not properly trained to do? _____ What were they? _____

_____

3. How do you feel about your tech school training in preparing you for your present duty assignment? _____

_____

What would you change? _____

_____

What could have been done to better train you for assignment as a 29130?

_____

_____

4. How good of a job are you doing as a 29130? _____

What sort of job performance rating would you give yourself if you were supervsr?

_____

Why? _____

PRECEDING PAGE BLANK-NOT FILMED

UGT:

5. Are you encountering difficulties in completing your upgrade tng requirement?

_____

With CDC material? _____

With skill proficiency requirement? _____

What do you think is the reason for these problems in UGT?

_____

_____

6. Which method (PI or Correspondence) do you like to receive tng under?

_____

Why? _____

_____

7. Which method do you feel prepared you to do your job? _____

Why? _____

8. Do you feel your tech school tng experience prepared you well enough to complete UGT requirements? _____

If NO, why not? _____

_____

_____

ATTITUDES:

9. How would you describe your attitude toward:

Your present assignment. _____

_____

Your supervisor. _____

_____

_____

Your co-workers. _____

_____

The Air Force. _____

_____

10. Do you intend to make the Air Force a career? _____

Why? _____

_____

_____

11. Are you satisfied with an assignment as a 291X0? _____

Why not? _____

_____

12. Knowing what you know now, would you want to receive training via PI or some other way, if you had just completed BMT and were going to be trained as a 291?

Which way(s)? _____

Why? _____

_____

13. How could the 291 course at Sheppard be improved? _____

_____

_____

PLACE _____

APPENDIX D DATE _____

SUPERVISOR INTERVIEW GUIDE

Supervisor Name: _____ Supervises Airman _____

COMPARISON: Give supervisor set of New Arrival.

1. What is your overall impression of the quality of 29130 tech school graduates upon arrival at their first duty station? _____

_____

2. Do you feel that Airman _____, upon arrival at this duty station was qualified to do the job of a 29130? _____

Why? _____

_____

3. How would you rate this airman's preparation/training to be a 29130 as compared to the average 29130 tech school graduate you have previously encountered?

_____

Why? _____

4. In what ways was Airman _____ (inferior/superior) to previous graduates?

_____

1. Skill upgrading completion.
2. Amount of supervision.
3. Performing tasks.
4. Attitude.
5. Other _____

5. Could this airman perform all the 29130 duties expected of him as a newly assigned graduate? _____ If NO, which one could he not do?

_____

_____

6. Were there specific job duties of this airman that required you, as his supervisor, to compensate for lack of training received in tech school? _____

If YES, which ones? _____

_____

_____

How did you compensate in these areas? _____

_____

7. Did this airman meet your expectations as a new tech school graduate upon his arrival at this duty station? _____ In what ways?

_____

_____

_____

THEORY:

8. Do you FEEL that this airman has a sufficient background in the "why" or theory of communications? _____ Why? _____

_____

_____

9. Will Airman _____ be hampered as he progresses in this career ladder because of a lack of theoretical background? _____ Explain:

_____

_____

10. At what grade does the need for theory become critical for job performance?

_____

11. In your opinion, how is communication theory best taught?

_____

_____

12. How much theory do you need, to do your job? _____

Explain: _____

_____

13. Which 291 task areas require a foundation in theory? (List)

_____

_____

Are any of these tasks ones that a 29130 might be required to perform?

_____ Which ones? _____

_____

_____

UPGRADE TNG:

14. How is this airman progressing toward his 5 skill level? _____

_____

Ahead of schedule.
On schedule.
Behind schedule.
May need to cross train.
Other _____

15. Is Airman _____ having difficulty with the CDC materials? _____

If YES, in what ways? _____

_____

16. Is Airman _____'s experience with upgrade training different than previous new tech school graduates you have supervised? _____

    In what ways? _____

    _____

17. How would you judge Airman _____'s performance in the skill proficiency requirements of UGT? _____

    What do you mean? _____

    _____

SUPERVISION:

18. How much supervision in these areas did this airman require by you upon arrival?

    Completing UGT requirements. _____

    Doing assigned tasks competently. _____

    Getting along with co-workers. _____

    Other: _____

19. Are you having discipline problems with this airman? (Late for work, antagonistic to those around him, infractions of office rules or AF rules, etc.) Explain.

    _____

    _____

MOTIVATION:

20. How would you describe this airman's overall motivation? _____

21. Is this airman motivated toward an Air Force career? _____