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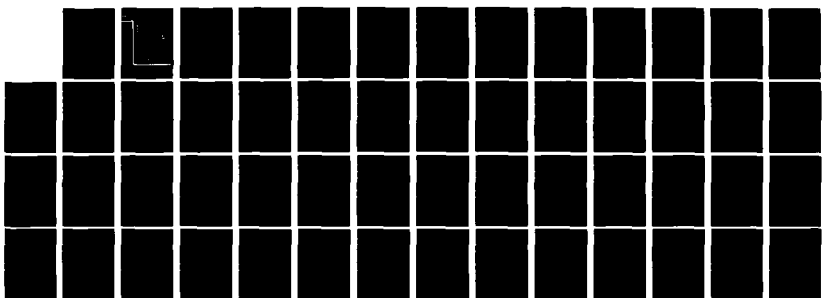

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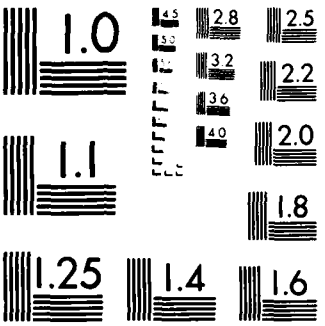

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PERSONNEL ROLES AND REQUIREMENTS FOR NON-CONVENTIONAL INSTRUCTION IN AIR FORCE TECHNICAL TRAINING

By

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A variety of non-conventional instructional formats are used in Air Force technical training. Manual and computer-based approaches to self-pacing are included, as are combinations of small-group pacing, used alone or with other formats. This effort investigates instructor roles and job requirements in a wide range of non-conventional instruction (NCI). A total of 99 instructors in nine Air Force technical training courses completed questionnaires concerning the percentage of time they spent performing selected roles and behaviors. They also indicated problems they experienced in the performance of these roles and behaviors. This paper presents implications of the findings for a theoretically based NCI instructor role model, for training of NCI instructors, and for the use of noninstructor personnel in selected roles and behaviors.

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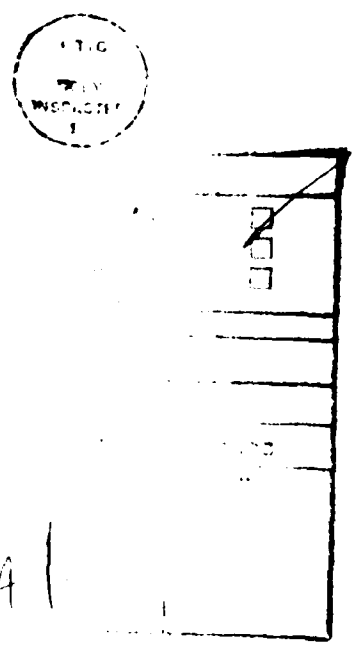

SUMMARY

The objectives of this effort were (1) to analyze and define actual instructor roles and compare them against theoretically "ideal" instructor roles, (2) to identify those roles that can best be performed by instructors versus noninstructor personnel, and (3) to provide suggestions for instructor training for non-conventional instructional (NCI) environments. The basic approach in this study made use of surveys, field visits and analysis of instructor roles in non-conventional technical training courses.

The principal findings were as follows. First, NCI instructors generally spend more time in behaviors that emphasize instructional management, administrative, and clerical responsibilities and less time in roles and behaviors that emphasize student/instructor tutorial activities than is considered theoretically ideal. Second, the percentage of time spent in theoretically ideal roles was influenced by the NCI instructors' years of experience, liking for the job, and the extent to which their prior instructor training was considered useful. An appropriate theoretical role model for the NCI instructor was judged to include the roles of Counselor, Modeler, Evaluator, Diagnostician, Remediator, Implementor, and Planner. Study findings also indicated that NCI instructors spend nearly 20 percent of their time performing roles not included in the theoretical role model, e.g., a variety of clerical and administrative activities which could logically be performed by noninstructor personnel.

Suggestions regarding instructor training center on the notion of teaching instructors how to not only perform each theoretical role, but also how to tailor their theoretical roles to the requirements of particular NCI environments. An instructor trained to meet the requirements of all the theoretical roles would then be capable of tailoring time spent in instructional activities to the unique needs of the particular NCI format to which that instructor is assigned.

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I. INTRODUCTION

Background

The accurate definition of instructor roles for non-conventional instructional (NCI) environments is prerequisite to the determination of adequate levels of staffing and appropriate instructor training. That instructor role definition is related as well to the overall success of non-conventional instruction was established by McCombs, Back, and West (1984), and these findings are consistent with factors identified by Fullan and Pomfret (1977) that influence the success of curriculum innovations in a variety of educational and training settings. In addition, any useful definition of instructor roles (and the design of an adequate training program for the NCI instructor) must be derived from an analysis of NCI settings and from data concerning actual percentages of time that instructors are spending in various roles and job tasks. Such data are available from both Air Force and Navy NCI environments.

Summers, Pelletier, and Spangenberg (1977) performed an extensive analysis of job performance requirements in Air Force self-paced instruction. Data from 1,119 instructors involved in individualized instruction, including computer-managed instruction (CMI) and computer-assisted instruction (CAI), were collected on percentages of time spent performing a number of validated tasks and attitudes toward various instructor activities. For the self-paced instructors surveyed, the rank order of times spent in various activities from most to least were performing administrative duties, counseling, preparing for instruction, conducting self-paced instruction, testing, developing curriculum, teaching group or team activities in an individualized instructional environment, conducting computer-managed or computer-assisted instruction, and supervisory duties. Behaviors which instructors felt were most critical included establishing a positive learning environment, applying motivation techniques appropriate to self-paced instruction, staying current in their technical specialty, attending professional in-service training, intervening at the appropriate time in the learning process, and recognizing ineffective study habits.

A similar analysis of instructor activities in individualized Navy CMI courses was conducted by Johnson and Graham (1982). Detailed records were kept of instructor activities in two Navy CMI courses, and it was concluded that there is a wide variability in jobs performed in each course due to differences in course design (e.g., size of modules, mastery standards, criteria for instructor intervention). In both courses, however, instructors were found to spend more time in routine transactions than in complex tutorial interactions. Johnson and Graham (1982) recommended that instructor training be carefully designed to avoid creating unrealistic expectations about the instructor's role in individualized courses. In addition, because of the variability in instructor roles, they recommended that a common core of content for instructor training be carefully selected which focused on those unique job requirements that differentiate self-and group-pacing. This point is also emphasized by Adamsky (1981), who discusses the difference in skills required of teachers in individualized versus group-oriented instruction.

Analysis of actual instructional roles in operational NCI environments must be augmented by analyses derived from instructional theory to ensure that the resulting role definitions are not restricted to any one school, location, or particular NCI mix. In addition to increasing the generality of the product, a proper theoretical analysis can

focus on essential instructional functions that must be fulfilled in any instructional setting (NCI or otherwise), and thereby ensure that the role definitions will reflect all activities critical to the promotion of student learning. One such theoretical analysis performed by McCombs and Dobrovolny (1980) specified seven theoretically ideal roles for instructors in a computer-managed instructional environment. The seven roles were placed in two categories: Learning Manager and Learning Facilitator.

Learning Manager roles included Planner of classroom operation and Implementor/Monitor of CMI plans. Learning Facilitator roles included Evaluator of individual student performance and provider of motivational performance feedback, Diagnostician of individual student learning problems, Counselor and advisor of students as to appropriate learning strategies, Remediator of student learning problems by prescription or administration of selected strategies and resources, and Modeler/Tutor of new information, skills, and personal responsibility. The definition of Learning Manager roles was generally based on principles from an operant, behaviorally oriented learning theory perspective, whereas the definition of Learning Facilitator roles was based primarily on principles within a cognitive learning theory framework.

Actual times spent by Air Force and Navy instructors in CMI settings performing behaviors within the seven roles were then compared with ideal times derived for these roles (McCombs & Dobrovolny, 1981). Primary findings in this study were that both Air Force and Navy instructors generally reported spending the majority of their time in the seven CMI instructor roles identified as theoretically ideal, but that actual Air Force and Navy instructor behaviors reflected more emphasis on CMI management, administrative, and clerical tasks, as compared to the theoretical role model emphasis on behaviors involving the facilitation of student learning.

Based on the preceding findings, a CMI Instructor Role Training Package was developed and evaluated with Air Force and Navy CMI instructors (McCombs, Dobrovolny, & Lockhart, in press). Evaluation findings indicated that the package met the goal of providing relevant and needed training. Instructor training in the theoretically based CMI roles contributed to more positive student attitudes toward CMI and toward their CMI instructors, and generally contributed to lower student elimination rates in the majority of participating Air Force and Navy schools. This research in CMI instructor role training was, therefore, seen as promising and as providing a framework for additional research and development (R&D) on instructor roles in other NCI settings.

Purpose of Study

Despite the progress that has been made in analyzing instructor roles and job requirements in individualized settings, several questions remain unanswered. First, is the theoretical role model developed for CMI environments generalizable to all other NCI formats (manual self-pacing, computer-assisted instruction, etc.) found in Air Force technical training? Second, to the extent that the roles are invariant and essential to NCI environments, are there significant differences in the times instructors spend performing these roles as a function of NCI format? Third, what problems do instructors experience in performing their NCI roles? Fourth, are there roles and behaviors currently performed by instructors that could be performed more efficiently and effectively by noninstructor personnel? Finally, what implications do the answers to these questions have for the design of an instructor training curriculum?

II. METHOD

Objectives

The specific objectives of this effort were (a) to analyze and define actual instructor roles and problem areas instructors experience in performing their roles in a variety of NCI settings, (b) to derive theoretically ideal instructor roles and behaviors required in these settings, (c) to identify those roles and behaviors that can best be performed by instructors and noninstructor personnel in each NCI setting, and (d) to determine implications of study findings for the design of an instructor training curriculum for NCI instructors.

Research Questions

The primary questions addressed by this R&D effort were as follows:

1. What percentage of time do instructors spend performing various roles and behaviors in each course?

2. What is the relationship between time spent in theoretically based roles and behaviors representative of each role?

3. What variables affect time spent in roles (i.e., liking for job, time in job, utility of training, military versus civilian instructor status, type of problems reported, and course characteristics such as student/instructor ratio)?

4. Do the problems instructors report differ as a function of course and NCI format?

5. What are the major types of problems instructors report?

6. Which roles do instructors spend a lot of time performing that could be performed by noninstructor personnel?

7. What are the implications of actual versus theoretically ideal times spent in roles for the design of an NCI instructor training curriculum?

Approach

The basic approach in this study consisted of the following steps:

1. Selection of Air Force technical training courses representing a variety of non-conventional formats for the analysis of instructor roles and perceived problems.

2. Revision and expansion of the CMI Instructor Roles and Behaviors Questionnaire (McCombs & Dobrovolny, 1981) and the design of other measures for data collection of NCI instructor-perceived problems.

3. Visiting of selected training courses, analyzing of course characteristics, administering and collecting questionnaire data.

4. Summarization of data by course and NCI format.

5. Performance of conceptual analysis of NCI roles, comparing findings with prior theoretical CMI instructor role model and other relevent theoretical and empirical literature, to determine the range of NCI instructor roles and behaviors across NCI settings.

6. Derivation of theoretically ideal NCI instructor roles and determination of ideal percentages of time instructors should spend in each role category.

7. Comparison of ideal and actual times spent per role and behavior, and identification of those roles and behaviors that could be performed by various classes of noninstructor personnel (e.g., proctors or instructor aides) in specific NCI settings.

8. Development of implications for instructor training and a set of recommendations for the design and implementation of an NCI instructor training curriculum.

Data Source

The selection of specific courses in Air Force technical training centers to be included in this investigation was based on (a) the extent to which the course was self-paced (percentage of the course that was implemented in an individually paced mode) and (b) the type of self-paced format used (e.g., programmed text, CAI). Air Force technical training centers currently implementing self-pacing to any degree are at Lowry, Chanute, Keesler, and Sheppard AFBs. Contacts established at these centers provided specific information on the courses which met the above selection criteria, thereby allowing the final selection of the courses described in Table 1.

The number of instructors available for questionnaire administration in the nine course groups were 17 in the PME course, 10 in the AES course, 5 in the ALS course, 10 in the APS course, 12 in the SVM course, 11 in the ACW course, 16 in the COP courses, 12 in the BEM/RS courses, and 6 in the ISD courses. The total number of instructors participating across courses was 99.

Measures

Three measures were used for collecting data from Air Force instructors in the selected NCI courses: an Instructor Roles and Behaviors Questionnaire, a Potential

Table 1. NCI Course Descriptions

Base/Course	Approximate Length	Date SP	Prior Format	Current Format	AFQT Entry Score(s)	Approximate # Students per Year	Student/ Instructor Ratio
Lowry AFB							
Precision Measuring Equipment (PME)	30 weeks	1974	Lockstep	100% Self-Paced on one shift	65 Electronics	700	1:18 classroom 1:8 lab
Inventory Management (IM)	6 weeks	1974	Lockstep	Back to Lockstep in 1981	45 General 50 Administrative	1,800	
Aircraft Armament Systems (AAS)	8-12 weeks depending on shred	1974	Lockstep	Back to Lockstep in 1980	45 Mechanical 45 Electronics	3,000	
Chanute AFB							
Aircraft Electrical Systems (AES)	15 weeks	1969	Lockstep	100% Self-Paced	35 Electronics	1,100	1:12 classroom 1:8 or 1:2 lab
Aircraft Life Support (ALS)	5 weeks	1972	Lockstep	Being converted to 100% Group-Paced	30 General	475	1:15 classroom
Aircraft Pneudraulics Systems (APS)	10 weeks	1975	Lockstep	100% Self-Paced; Going to Group-Pacing on one block	30 Electronics	500	1:12 classroom 1:5 lab
Special Vehicle Maintenance (SVM)	8-11 weeks depending on shred	1970	Lockstep	Group-paced with group-paced CAI, CAI Testing	30 Mechanical	400	1:16 lecture 1:8 lab

Table 1 (cont.)

Base/Course	Approximate Length	Date SP	Prior Format	Current Format	AFQT Entry Score(s)	Approximate # Students per Year	Student/ Instructor Ratio
Keesler AFB							
Aircraft Control and Warning (ACW)	6 weeks	1972 1978 cell-paced	Lockstep	100% Cell-Paced (small group-paced)	45 General	600	1:5
Computer Operator/ Programmer (COP)	5-10 weeks			85% Lockstep 15% CAI for Drill and Practice			
Sheppard AFB							
Audio-Visual Methods (AV)	2 weeks	1974	Lockstep	100% Self-Paced	N/A	70	
Instructional Systems Development (Short ISD)	1 week	1972	Lockstep	100% Self-Paced	45 General	337	1:12
Instructional Systems Designer (Long ISD)	4 weeks	1976	Began as Self-Paced	85% Self-Paced; 15% Group-Paced	65 General	150	1:12
Biomedical Equipment Maintenance (BEM)	32 weeks	1972	Lockstep	40% Lockstep; 60% Self-Paced	65 Electronics	100	1:3
Radiologic Specialist (RS)	16 weeks	1972	Lockstep	70% Lockstep 30% Self-Paced with CAI	45 General	240	1:8

Problems in Performing Instructor Roles Questionnaire, and a short Biographical and Background Information measure. These measures are described in more detail below.

Instructor Roles and Behaviors Questionnaire. The CMI Instructor Roles and Behaviors Questionnaire developed by McCombs and Dobrovolny (1981) was analyzed for its completeness and appropriateness to other NCI formats, was modified to remove direct reference to CMI, and was retitled Instructor Roles and Behaviors Questionnaire. Instructors then were asked to indicate the percentage of time they spend performing each of 10 general categories of instructor roles and each of a number of specific instructor behaviors within these 10 role categories, as well as an 11th "Miscellaneous" category. Within each of the two parts of this questionnaire, instructors were first asked to check the roles (or behaviors) they performed as a part of their regular job. For the checked roles (or behaviors), instructors were then asked to indicate time spent on a 9-point scale (1 = very little time, 9 = very large amount of time).

The procedure described by Archer (1966) for comparing across instructors on specific roles or behaviors was used in subsequent data analyses. This procedure consists of converting relative time-spent ratings to percentage values per the following formulas:

(a) $\sum_{i=1}^{n} r_i$ = sum of ratings on n roles or behaviors

(b) $\frac{r_i}{\sum_{i=1}^{n} r_i} \times 100$ = percent of time spent on role or behavior

where r = rating provided on role or behavior i.

The percentage of time spent on any role category was obtained by summing the percentages spent on the behaviors within that role category.

Of the 10 instructor role categories in this questionnaire, the first seven were those theoretically ideal roles identified by McCombs and Dobrovolny (1980); the remaining three (Course Author and Evaluator, Equipment Maintainer, Course Supervisor) represented categories of behaviors typically performed by instructors in NCI environments that might account for some of the deviations between theoretically ideal versus actual NCI instructor roles. A copy of this questionnaire can be found in Appendix A.

Potential Problems in Performing Instructor Roles Questionnaire. According to a recent study by Plato (1981), many of the potential problems instructors experience that can directly or indirectly influence performance of their instructor roles in NCI environments are attitudinal in nature. These attitudinal problems may include feelings of depersonalization/dehumanization, isolation/inadequate communication, intimidation/confusion, loss of power or sense of essentiality, increased vulnerability, and feelings of being controlled or monitored. In addition to these internal, attitudinal problems, a number of external problems related to such issues as inadequate staff/clerical support, management of student throughput, and ability to handle student academic, motivation, or discipline problems may exist.

The foregoing kinds of internal and external problems formed the basis for the construction of the Potential Problems in Performing Instructor Roles questionnaire. The

questionnaire was divided into two parts, representing internal and external problem areas, respectively. Within these two parts of the questionnaire, instructors were asked to rate how often each item was a problem and, for each item indicated as a problem to at least some degree, how major a problem they felt it was. Ratings in the first area were from 1 (not at all) to 5 (almost always); ratings in the second area were from 1 (not at all) to 5 (major). Parts I and II of the questionnaire consisted of 20 items each.

The items in Part I of the questionnaire were divided into subscales pertaining to Instructional and Management issues. Items in Part II of the questionnaire were divided into subscales pertaining to Personnel, Student, Facilities and Instructional issues. The breakdown of items into subscales is shown in Table 2. A copy of the questionnaire can be found in Appendix B.

Biographical and background information. A number of biographical and background variables were identified as potential determinants of time spent in various NCI instructor roles. These included instructor status (military versus civilian), years of experience as an NCI instructor, liking for job, and utility of instructor training. Copies of the data collection sheets for this information can be found in Appendix C.

Preliminary Analysis of Ideal NCI Instructor Roles

Prior to the analysis of actual times spent by NCI instructors in various roles and behaviors, a conceptual analysis of NCI formats and their implications for instructor roles was performed. The theoretical instructor role model developed by McCombs and Dobrovolny (1980) formed the basis for analyzing potential deviations in theoretically ideal roles as a function of particular NCI format characteristics (e.g., the percentage of group and self-pacing; the use of CAI for instruction, testing, or practice; the use of small group-pacing). In addition, characteristics of each course (e.g., student entry requirements, student/instructor ratios, percentage of classroom and laboratory activities) were examined in conjunction with each course's particular NCI format.

This preliminary analysis generally indicated that, regardless of NCI format and course characteristics, the same theoretically ideal instructor roles derived by McCombs and Dobrovolny (1980) were applicable. The ideal rank ordering of instructor roles was also judged to be appropriate to all NCI formats, although absolute times spent in each role category would be expected to vary as a function of particular format or course characteristics. For example, if CAI is used to perform the majority of remediation activities, instructors would be expected to spend less time in the Remediator role in this format than in one which used instructors for all remediation activities; however, the ranking of the Remediator role as requiring relatively more time than the Implementor role but less time than the Diagnostician role would be expected to remain essentially the same. Thus, the ideal role order of Counselor, Modeler, Evaluator, Diagnostician, Remediator, Implementor, and Planner was judged to be an appropriate preliminary model for comparison with actual NCI instructor roles. (Appendix A includes a description of these ideal roles.)

A detailed discussion of ideal NCI roles as derived from R&D findings is presented in the Discussion and Conclusions section of this paper.

Table 2. Subscales for Potential Problems In Performing Instructor Roles Questionnaire

Items	Subscale
Part I	
1-9, 11, 13, 16, 17, 18, 20	Instructional Issues
10, 12, 14, 15, 19	Management Issues
Part II	
1, 2, 9	Personnel Issues
3-8	Student Issues
10-17	Facilities Issues
18-20	Instructional Issues

III. RESULTS

The following sections report the results of data analyses which addressed the first five research questions of this investigation. The Statistical Package for the Social Sciences (SPSS) (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975) was used in the calculation of analyses reported. The last two research questions are addressed in the Discussion and Conclusions section of the paper.

Actual Versus Ideal NCI Instructor Roles and Behaviors

The average percentages of time Air Force NCI instructors in each course were spending on each role and on behaviors associated with each role were calculated using the formulae described by Archer (1966). That is, instructor "relative time spent" ratings on Parts I and II of the Instructor Roles and Behaviors Questionnaire were individually converted to percentage values, separately for each part of the questionnaire; and the values were summed and averaged by course for each role category. A rank ordering of time spent in each role was derived for comparison of actual versus ideal time-spent rankings.

Comparison of the role rankings obtained in the courses in this investigation with the ideal role order derived by McCombs and Dobrovolny (1980) revealed considerable differences between them. In every NCI course, the two highest ranked roles were Evaluator and Implementor (see Table 3), whereas in the ideal ranking these roles occupy the third and the sixth positions, respectively. In six of the courses, Counselor was ranked at least fifth, instead of first, as in the ideal role ranking. Likewise, Modeler (which held the second position in the ideal role model) ranked no higher than third (two courses) and as low as eighth (two courses) in the courses investigated. Further, two (noninstructional) *support roles--Author and Equipment Maintainer--occupied ranks* as high as third (in two courses), fourth (two courses), fifth (two courses), and sixth (one course).

In terms of percentages of time spent in the roles (see Table 4), half again as much time was spent in the Evaluator and Implementor roles (17.61% and 16.39%, respectively) as was spent in the Modeler (9.33%) and Counselor (9.58%) roles. Further, it is interesting to note that two noninstructional roles (Author and Equipment Maintainer) occupied 7.78 percent and 8.45 percent of instructors' time.

A question of considerable interest to those whose responsibility is the development of an instructor training curriculum is the degree of similarity among courses designated as NCI. Comparison of role rankings across courses revealed some striking consistencies. As noted, times spent in Evaluator and Implementor roles were ranked highest in every course. Likewise, the Miscellaneous and Supervisor roles were ranked in the two lowest positions in all courses except one. In five courses, Author was ranked eighth or ninth, while in four courses, Equipment Maintainer was ranked eighth or ninth. Counselor, Modeler, Diagnostician, Remediator, and Planner occupied diverse ranks across courses, however. The average actual time-spent rankings across the nine courses were Evaluator, Implementor, Diagnostician, Modeler, Counselor, Remediator, Equipment Maintainer, Planner, Author, Miscellaneous, and Supervisor.

Table 3. Comparison of Role Ranks by Course[a] with Ideal Role Rank

Ideal Order	COP	PME	AES	ALS	APS	SVM	ACW	BEM/RS	IND
Counselor	Implementor	Evaluator	Evaluator	Evaluator	Evaluator	Implementor	Implementor	Evaluator	Evaluator
Modeler	Evaluator	*Implementor*	*Implementor*	*Implementor*	*Implementor*	Evaluator	Evaluator	Implementor	Implementor
Evaluator	Planner	Modeler	Equipment Maintainer	Equipment Maintainer	Counselor	Modeler	Counselor	Planner	Diagnostician
Diagnostician	Modeler	Diagnostician	Counselor	Planner	Equipment Maintainer	Remediator	*Diagnostician*	*Diagnostician*	*Author*
Remediator	Counselor	Equipment *Maintainer*	Diagnostician	Counselor	Diagnostician	Diagnostician	Modeler	Author	Remediator
Implementor	Diagnostician	Counselor	Author	Diagnostician	Remediator	Planner	Remediator	Modeler	Counselor
Planner	Remediator	Remediator	Remediator	Remediator	Modeler	Author	Planner	Equipment *Maintainer*	Planner
	Author	Author	Modeler	Modeler	Author	Counselor	Author	Remediator	Modeler
	Equipment Maintainer	*Planner*	Planner	Author	Miscellaneous	Equipment Maintainer	Equipment Maintainer	Counselor	Equipment *Maintainer*
	Supervisor	Miscellaneous	Supervisor	Miscellaneous	Planner	Supervisor	Supervisor	Supervisor	Supervisor
	Miscellaneous	Supervisor	Miscellaneous	*Supervior*	*Supervisor*	*Miscellaneous*	Miscellaneous	Miscellaneous	Miscellaneous

[a]See Table 1 for full course names.

Table 4. Percentage of Time in Roles by Course

Course[a]	Roles										
	Planner	Implementor	Evaluator	Diagnostician	Counselor	Remediator	Modeler	Author	Equipment Maintainer	Supervisor	Miscellaneous
PME	4.18	14.41	16.76	11.47	9.82	8.95	14.17	7.20	10.92	.18	1.95
AES	5.71	14.68	18.05	10.90	11.14	8.70	7.01	9.59	11.80	2.41	0
ALS	10.61	14.63	16.31	9.51	10.29	9.41	8.17	5.11	11.14	0	2.30
APS	2.18	20.53	24.40	9.06	9.81	8.86	5.51	4.76	9.78	0	5.13
SVM	9.42	15.86	15.23	10.30	7.82	10.35	10.96	8.88	7.20	2.91	1.07
ACW	9.36	18.92	17.01	10.37	10.73	9.78	10.29	7.75	5.29	.49	0
COP	12.00	17.27	14.69	9.09	9.19	8.48	11.57	7.27	5.84	2.50	2.14
BEM/RS	12.32	15.72	17.17	10.20	7.89	8.65	8.83	8.98	8.75	1.48	0
ISD	8.85	15.49	18.90	10.96	9.57	9.79	7.50	10.51	5.58	2.86	0
$\bar{X}$	8.29	16.39	17.61	10.21	9.58	9.22	9.33	7.78	8.48	1.43	1.40
Range	10.14	6.12	9.71	2.41	3.32	1.87	8.66	5.40	6.51	2.9	5.13

[a]See Table 1 for full course names.

Relationship Between Instructor Roles and Behaviors

The relationship of the roles to the behaviors which comprise them was examined next via the analysis of correlations between role categories in Parts I and II of the Instructor Roles and Behaviors Questionnaire. In every case but one (Planner), the times that instructors reported spending in the roles were significantly positively correlated with the times they reported spending in their component behaviors. These relationships were as follows:

Implementor	$r = .35, p < .001$
Evaluator	$r = .35, p < .001$
Diagnostician	$r = .31, p < .002$
Counselor	$r = .35, p < .001$
Remediator	$r = .29, p < .003$
Modeler	$r = .31, p < .002$
Author	$r = .68, p < .001$
Equipment Maintainer	$r = .65, p < .001$
Supervisor	$r = .72, p < .001$

In other words, as instructors reported spending more time in each role, they likewise reported spending more time in the corresponding behaviors. Further analysis of data concerning behaviors was therefore considered to be redundant and was exluded from this paper.

Variables Affecting Time Spent in NCI Instructor Roles

Selected variables from the Biographical and Background Information measures were examined via correlational and discriminant analyses to assess their potential relationships to time spent in various NCI instructor roles across courses.

Three variables appeared to influence instructors' rankings of these roles: years of experience teaching in the course, degree of positive feelings for the role of instructor, and the extent to which the instructors felt that their training for the instructor role was useful. A fourth variable, military versus civilian status of the instructor, was not related in a systematic way to the times instructors reported spending in these roles.

To examine the relationship of years of experience with the role rankings, instructors were divided into two groups: those who had 2 or more years of experience and those who had less than 2 years experience. Generally speaking, discriminant analyses revealed that instructors in the two groups differed in times spent in various roles ($X^2 = 23.26$, p .02). Correlational analyses indicated that instructors with more experience spent more time in the Planner role ($r = .18$, $p < .04$), the Author role ($r = .32$, $p < .001$), and the Supervisor role ($r = .19$, $p < .03$), but less time in the Evaluator ($r = -.18$, $p < .04$) and the Maintainer ($r = -.20$, $p < .02$) roles.

Correlational analyses also indicated that the degree to which instructors liked their jobs was related to their time in roles. The higher the instructors rated their jobs, the more time they spent in the Planner ($r = .20$, $p < .03$) and the Diagnostician ($r = .33$, p .001) and the Remediator ($r = .04$, $p < .04$) roles. However, this relationship was reversed for the Implementor ($r = -.25$, $p < .007$) and Evaluator ($r = -.20$, $p < .03$) roles.

Finally, correlational analyses indicated that the more useful the instructors rated their training, the more time they reported spending in the Planner ($r = .20$, $p < .03$) and the Diagnostician ($r = .27$, $p < .005$) roles, and the less time they spent in the Implementor ($r = -.23$, $p < .003$), Evaluator ($r = -.18$, $p < .04$), and Maintainer ($r = -.17$, $p < .05$) roles. Interestingly, instructors who rated their training as useful also rated their jobs more positively ($r = .66$, $p < .001$).

Problems Performing NCI Instructor Roles

Descriptive statistics, F-tests, and correlational analyses were used in the analysis of data from the Potential Problems in Performing Instructor Roles questionnaire. On this questionnaire, instructors were asked to indicate what problems were most evident and serious in their roles as instructors. The following table (Table 5) records their mean ratings of problems in five areas, by course. The areas were instructional issues, management issues, personnel issues, student issues, and facilities issues. Instructors in most courses reported more severe/more frequent problems in the management and personnel areas, and generally fewer/less severe problems in the facilities and instructional issues areas. As might be expected, however, univariate F-tests on these data indicated there were significant differences between courses in terms of the problems they reported in certain areas. As can be seen in Table 6, reports of problems differed across courses in the instructional, management, and personnel areas.

Correlational analyses revealed that the problems reported were related to the time the instructors spent in roles: Instructors who reported spending more time in the Planner role reported fewer problems in the instructional issues area ($r = -.27$, $p < .009$), whereas instructors who spent more time in the Modeler role reported fewer problems in management areas ($r = -.18$, $p < .05$). Instructors who reported spending more time in the Equipment Maintainer role reported more problems in the management area ($r = .21$, $p < .02$). Instructors who spent more time in the Author role reported more student problems ($r = .22$, $p < .02$) and more facilities problems ($r = .26$, $p < .01$). In addition, instructors who spent more time in the Miscellaneous role reported more instructional problems ($r = .25$, $p < .01$) and more facilities problems ($r = .19$, $p < .04$).

Further, the instructors' ratings of their jobs were related to the problems they reported. In general, the higher they rated their jobs, the fewer or less severe were the problems reported in the instructional issues ($r = -.33$, $p < .003$), management issues ($r = -.30$, $p < .002$), and personnel issues ($r = -.20$, $p < .03$) areas. Specific items that were significantly related to job rating are listed below.

Instructional Issues

Item #	Correlation	Item
1	$r = -.23$, $p < .01$	job too mechanical
3	$r = -.19$, $p < .04$	too much information/don't know how to use
4	$r = -.21$, $p < .02$	isolation from students, instructors
5	$r = -.44$, $p < .001$	job seems unimportant
8	$r = -.23$, $p < .02$	no personal styles possible
9	$r = -.51$, $p < .001$	unrewarding system for instructors

Table 5. Ratings of Problems by Course: Means and Standard Deviations

Course[a]		Instructional Issues	Management Issues	Personnel Issues	Student Issues	Facilities Issues
PME	M	1.987	2.646	2.923	2.115	2.369
	SD	.739	0.876	0.784	0.759	0.735
AES	M	1.819	2.225	1.667	1.771	1.750
	SD	0.452	0.824	0.735	0.471	0.694
ALS	M	2.181	3.450	3.417	1.625	2.118
	SD	0.918	1.668	1.316	0.438	0.375
APS	M	2.160	2.844	2.296	1.870	1.917
	SD	0.833	1.370	0.824	0.588	0.472
SVM	M	1.492	2.114	2.714	2.214	1.911
	SD	0.239	0.576	0.705	0.951	0.664
ACW	M	1.731	2.367	2.167	1.444	1.750
	SD	0.693	1.054	1.188	0.292	0.524
COP	M	1.356	1.480	1.667	1.633	1.563
	SD	0.331	0.559	0.471	0.532	0.607
BEM/RS	M	1.556	2.400	2.630	2.259	2.153
	SD	0.236	0.775	0.904	0.862	0.548
ISD	M	1.611	2.500	2.750	1.833	1.781
	SD	0.272	0.825	0.788	0.561	0.213

[a]See Table 1 for full course names.

Table 6. F-Test Results of Problems Reported

Issues	F	Mean Square	Probability
Instructional	2.034	0.682	0.057
Management	2.277	2.036	0.033
Personnel	3.511	2.430	0.002
Student	1.371	0.609	0.227
Facilities	1.750	0.629	0.105

10	r = -.25, p < .01	isolated from management decision process
11	r = -.39, p < .001	system information irrelevant to helping student
14	r = -.25, p < .01	management data collection is punitive
15	r = -.19, p < .04	management doesn't know our problems

Management Issues

1	r = -.22, p < .02	isolated from management decision process
2	r = -.19, p < .04	no instructor input in management decision process
3	r = -.36, p < .001	punitive data collection
4	r = -.28, p < .005	management ignorant of instructor problems
5	r = -.19, p < .04	can't get anything changed

Personnel Issues

2	r = -.32, p < .001	too few instructors

The instructors' ratings of the utility of their training were also related to the problems they reported: Those who rated the utility of their training high reported fewer problems in the instructional ($r = -.41$, $p < .001$) and management issues ($r = -.46$, $p < .001$). The specific items significantly related to utility of training were as follows:

Instructional Issues

Item #	Correlation	Item
1	r = -.32, p < .001	job too mechanical
3	r = -.20, p < .03	too much information to use
4	r = -.32, p < .001	no student/instructor interaction
5	r = -.46, p < .001	job is unimportant
7	r = -.22, p < .02	isolated from students
8	r = -.39, p < .001	no leeway for personal style
9	r = -.56, p < .001	unrewarding system
10	r = -.23, p < .02	un-useful information
11	r = -.43, p < .001	no payoff
13	r = -.21, p < .03	difficulty adpating to role
14	r = -.43, p < .001	little control over education process
15	r = -.21, p < .02	students pushed to work too fast
17	r = -.21, p < .02	materials too difficult
18	r = -.25, p < .01	materials/tests are confusing

Management Issues

1	r = -.44, p < .001	management decisions not understandable
2	r = -.40, p < .001	no instructor input
3	r = -.27, p < .006	punitive data collection
4	r = -.39, p < .001	management doesn't understand instruction problems
5	r = -.34, p < .001	can't get anything changed

The proportion of time instructors have spent as a non-conventional instructor was related to their ratings of problems. The longer the instructors have worked in an NCI environment, the more problems they are likely to report in all areas:

Instructional issues	($r = .27$, p .009)
Management issues	($r = .30$, p .002)
Personnel issues	($r = .32$, p .001)
Student issues	($r = .26$, p .007)
Facilities issues	($r = .24$, p .01)

Finally, an attempt was made to group the courses examined in this paper into meaningful formats. Unfortunately, there was so much variability across the nine courses that this attempt resulted in seven distinct formats. When the results were analyzed by course and by format, it was discovered that there were greater differences between courses than between formats, so that these groupings served no useful purpose.

IV. DISCUSSION AND CONCLUSIONS

The three principal findings in this investigation were as follows. First, NCI instructors spend more time in roles and behaviors that emphasize instructional management, administrative, and clerical responsibilities and less time in roles and behaviors that emphasize student/instructor tutorial activities than is considered theoretically ideal. Second, the percentage of time spent in theoretically ideal roles was influenced by the NCI instructors' years of experience, positive attitude and liking for their job, the extent to which there was the perception that prior instructor training was useful and relevant, and perception of a relatively low number of instructional and management problems in the training environment. Third, the number and types of problems reported by NCI instructors were influenced by how highly they rated their jobs, how highly they rated the utility of their instructor training, and how much time they had spent as an instructor in an NCI environment.

The findings related to actual times spent performing various NCI roles and behaviors are consistent with those reported by Johnson and Graham (1982), McCombs and Dobrovolny (1981), and Summers et al. (1977), all of whom found that instructors in non-conventional environments spend more time in clerical and administrative duties than in tutorial or learning facilitator activities. In addition, the finding of considerable variability in times spent in various roles and behaviors across NCI courses and formats is consistent with Johnson and Graham's (1982) finding with Navy CMI instructors and with McCombs and Dobrovolny's (1981) findings with both Navy and Air Force CMI instructors. That time spent in theoretically ideal instructor roles was positively related to NCI instructors' liking for their jobs and to the usefulness of their prior instructor training, however, implies that relevant role training can positively impact both the time spent in theoretically ideal roles and the instructors' attitudes about their NCI roles. Prior to expanding on the implications of study findings for NCI instructor role training and staffing requirements (i.e., using noninstructor personnel for certain less theoretically ideal job tasks), the following section will focus on a discussion of the implication of study findings for a derivation of ideal NCI instructor roles.

An Ideal NCI Instructor Role Model

In order to develop a relevant NCI instructor training curriculum, as well as to identify those instructor tasks that could most effectively and efficiently be performed by noninstructor personnel, a theoretical framework is needed which identifies and prioritizes instructor roles and behaviors such that student learning is maximized. The preliminary analysis of ideal NCI instructor roles indicated that the theoretical instructor role model developed by McCombs and Dobrovolny (1980) for the CMI instructor was appropriate for instructors in other NCI environments in both its specification of particular roles and its prioritization of these roles. Study findings generally support this preliminary analysis and suggest how absolute percentages of time spent in each role might vary as a function of NCI format characteristics.

A starting point for determining how percentages of time spent in particular roles might vary depending on NCI format is the present finding of considerable variability in times spent in each role across courses. Some variation in time spent is to be expected, of course, since the NCI courses and formats studied operate under different

types of school management (whose philosophies concerning instructor involvement in Planning, for example, may differ) with varying quality of students. Yet even these differences may be merely expedient, rather than ideal, adaptations to unique situations. The wide deviations from the ideal role rankings suggest the possibility that some critical instructional functions are not being adequately supported. A closer examination of these roles and the possible sources of variance from the ideal might help to substantiate this point.

The role of Counselor should require the largest percentage of the instructor's time, according to the ideal role model. For any instructional system to be maximally efficient (all students achieving learning goals quickly and thoroughly), students must be taught appropriate learning strategies to cope with their particular learning problems and/or the requirements of the instructional format and learning task. If this is not done, students will be forced to rely on their prior learning experiences, which are often inadequate. The result may be increased time in technical training as well as loss (early failure) of some potentially acceptable students. The time needed for this role should not vary significantly across courses or formats, unless course materials are not well matched to the students in terms of level of difficulty or requirements for prerequisite skills, or if the materials simply fail to teach because of poor construction.

The next most time-consuming role is Modeler. All instructors, whether they realize it or not, present a model of personal responsibility and military conduct to their students. The only way they can avoid doing this is to not be present in the classroom. In addition, an instructor will often be required to demonstrate skills and techniques that students must learn. Thus, courses that teach primarily motor skills (e.g., packing a parachute) may require that an instructor spend more time modeling than would courses that teach primarily cognitive skills.

The next three roles--Evaluator, Diagnostician, and Remediator--may be naturally grouped together, as the latter two functions derive from the first. In any instructional system, student learning must be evaluated to ensure both that individual students are achieving instructional goals and that the system as a whole is functioning effectively. In systems that use computerized testing, there should be a somewhat lower time requirement for this function. Following evaluation, students not achieving learning goals should be targeted for diagnosis of learning problems, and appropriate remediation strategies should be devised. If CAI (or programmed text) is the medium of instruction, some of these functions may be assumed by the computer (or the text), depending on the adequacy of the branching and remediation strategies inherent in the materials. If the materials are good, somewhat less time in these areas may be required of instructors.

For the line instructor, the next most time-consuming role will be that of Implementor/Monitor, followed by Planner. Except when old courses are being revised or new courses implemented, there should be little variation in these roles. During times of change, some instructors in some schools may spend more time than usual in planning, depending on the school management's philosophy concerning this issue. But once a course is in operation, little actual time should be spent in the Planner role. Somewhat more time will be spent in the Implementor/Monitor role, as students must be accurately tracked through the system. Time spent in both Planner and Implementor roles will be affected by format, however. In highly automated courses, less time will be required for these roles. For example, in courses that use a computer-based management system, students will be directed to the different course segments and will be tracked by the

computer. Courses that have less computer support available (e.g., those that use CAI primarily for drill-and-practice) or that are mixed in format (e.g., CAI plus group discussion and lecture) will require more time from instructors in these roles.

Author, Equipment Maintainer, and Supervisor are not, strictly speaking, instructional roles. Once again, unless a course is being revised, or unless subject matter is constantly changing due to technological innovation, authoring should not be allowed to demand much time because it prevents instructors from engaging in other instructional functions. If there is a long-term need for extensive authoring, additional specialists should be dedicated to this task. Similarly, equipment maintenance is not an instructional function. If much equipment is used in a course and there is a large requirement for maintenance, additional specialists should be assigned this duty, rather than using instructors whose time should be allocated to the primary instructional functions. Finally, the Supervisor role is most frequently assigned to senior personnel and therefore, should not vary much across line instructors, regardless of course or format.

The appropriate division of time among these roles is dictated by specific needs within any instructional system. Legitimate variations in time (but probably not in rankings) may occur depending on use or nonuse of computerized testing, CAI, programmed text, etc. Large or frequent deviations fom the ideal times (or rankings) may indicate (a) inadequate learning materials, (b) inappropriate basic instructional plan, (c) inappropriate match of students and materials (e.g., students may have deficient backgrounds in prerequisite skills), (d) diversion of instructors from instructional to support functions because of lack of support staff, or (e) insufficient training of instructors in the ideal instructional roles, etc. Such deviation should generate efforts to solve these basic problems, so that the necessary instructional functions can be fulfilled.

The legitimate variations in time allocation in the ideal roles should be determined for each format as a function of the instructional delivery systems (instructional plan, media, and learning materials) used. In doing this, it is important to remember that in any course or format, all of the functions described in the ideal roles must be met by some aspect of the system if instructional quality is not to suffer. In other words, if the instructors do not perform certain roles, then these roles must be assumed by support staff, learning materials, or the delivery equipment such as computers. The formats encountered in this study were typified by their variability in the mix of media and learning materials that each format used. Following, then, is a discussion of the impact that each of these media or materials or instructional plans will have on the time allocations for the instructor roles. The underlying assumption in this discussion is that increases in time spent in a particular role due to format will, by definition, reduce the amount of time available for remaining roles.

The primary media used in these examples of non-conventional instruction are CAI, programmed text, audio tape/slides/videotape, lecture/demonstration, and group discussion. Computer-assisted instruction may be used to present new information (for the whole course or only part of it), or it may be used simply to present drill-and-practice exercises relating to material presented in other ways, or it may be used to test students. Each use will have a different impact on the major instructional roles. Because CAI which presents new information typically has testing and remediation strategies built into it, instructors involved in a course that relies primarily on CAI will spend less time in the Evaluator, Diagnostician, and Remediator roles. If CAI is used for only a part of a course, there will be more demand on instructors in the Planner and Implementor roles, since CAI

and non-CAI portions of the course will have to be appropriately integrated. The demand for increased Planner and Implementor time will likewise hold true for CAI used to present drill-and-practice exercises, and for the same reason. CAI used only for testing will relieve instructors somewhat from their Evaluator functions but, generally speaking, they will still be responsible for diagnosing learning difficulties and assigning remedial work.

Programmed text may also be used for the entire course or merely for parts of it. Depending on the adequacy of the branching and remediation strategies built into the materials, instructors should be required to spend less time in the Evaluator, Diagnostician, and Remediator roles. More time will be required in Planner and Implementor roles, however, depending on the manner and extent to which programmed text is used.

Lecture and/or demonstrations may require more instructor time in the Planner and Implementor roles, again depending on the frequency with which they are used. Both of these media of instruction will increase the amount of time instructors spend in the Modeler role, since modeling is inherent in the presentation of a lecture or demonstration. Group discussion similarly will place large modeling demands on instructors who serve as discussion leaders, as well as increased Planner and Implementor role demands, if this medium is used frequently.

Audio tape/slide/videotape are normally used as adjuncts to some other medium of instruction. Because their use must be coordinated with other course activities, extensive reliance on these media will increase the requirements in the Planner and Implementor roles.

Different instructional arrangements, aside from media mix, also will have an impact on time allocations to the various instructional roles. The three major NCI arrangements encountered in this study were group-paced, cell-paced, and self-paced. Group-pacing places larger demands on instructors for planning and implementing. It is often theorized that with group-pacing there is a reduced need for individual diagnosing and remediating, but this may be an illusion. Ignoring or eliminating Diagnostician and Remediator roles can result in the failure or unearned promotion of students who have not learned the necessary material. Unless arrangements can be made to individualize diagnosis and remediation, these two instructional functions must be fulfilled with all students as a group. This is extremely difficult to achieve adequately.

Cell-pacing, in which students learn in small and often homogeneously grouped teams, also increases Planner and Implementor role requirements. Similar problems exist with respect to Diagnostician and Remediator roles as are present in group-paced arrangements, although with the smaller student/instructor ratio in cell-pacing, the diagnosis of individual student learning problem is easier to achieve.

Self-pacing has somewhat different effects on the instructional roles. Depending on the extent to which it is used (either as all or part of a course), it may reduce the time needed for Planner and Implementor roles once the initial course design proves to be workable. Because instructors spend considerably less time talking to students in a group, there is more time available for the Counselor role, as well as for individual diagnosis and remediation. In addition, if self-pacing is manually managed versus computer managed, instructors will spend more time in the Monitor/Implementor role.

Roles for Noninstructor Personnel in NCI

Study findings indicated that NCI instructors spend nearly 20 percent of their time performing roles not included in the theoretical role model: Author, Equipment Maintainer, Supervisor, and Miscellaneous (consisting of a variety of clerical and administrative activities). As discussed earlier, these are not instructional roles in the sense of directly contributing to the management or facilitation of student learning, and thus, could logically be performed by noninstructor personnel. In practice, however, there will be times that instructors will be involved to some degree in these noninstructor roles, but the degree of this involvement should be minimal if other ideal instructor roles are to be performed adequately. It is of value, therefore, to analyze the requirements of these noninstructor roles in terms of their implications for the types and number of noninstructor personnel that could be used.

As a preliminary step in the direction suggested above, Author functions may best be performed by course development personnel, with only limited involvement of instructors as subject-matter experts. Equipment Maintainer functions could be performed by specially designated students (e.g., those who have prior experience or who are progressing ahead of schedule in their course) or by a staff of individuals who perform this function across equipment-oriented courses at each technical training center. Supervisor functions could be limited to individuals in that capacity, and the Miscellaneous activities could be delegated to clerical assistants or aides. Further study of staffing requirements, however, is necessary to determine more adequately the types and number of personnel for these activities.

Instructor Role Training Implications

The foregoing analysis has implications for the design of training for instructors who will be engaged in non-conventional instruction. As examination of the course formats reveals, non-conventional instruction is typified by variability in instructor roles and behaviors. Yet, it is apparent that the instructional functions encompassed in the ideal instructor roles must be fulfilled if the resulting instruction is to be adequate, i.e., if students are to meet training goals in a reasonable amount of time. Thus, instructor training might profitably center on two tasks: (a) teaching instructors how to achieve the functions in each of these roles and (b) developing instructors' skills in analyzing an instructional system to determine which of the instructional roles are being adquately fulfilled by other aspects (than the instructor) of that system. Instructors trained to meet the requirements of all of the theoretically ideal roles would then be capable of tailoring their efforts in their instructional activities to the unique needs of the particular system to which they are assigned.

The data concerning instructors' years of experience, liking for their jobs, utility of training, and problems reported are complex. It is not surprising that instructors in the various courses differed in the problems they reported. These courses varied not only in content but also in management structure and philosophy, location, quality and type of students, and--not least--course content. It would in fact be surprising if differences in problems did not exist. Although no categorical conclusions can be drawn, the data do suggest that certain relationships might merit further exploration. Specifically, instructors with 2 or more years of teaching experience reported spending a large percentage of time in the noninstructional, course management roles (planning, authoring,

supervising). These instructors also reported more problems in all areas. It is possible that instructors with more years in service and more supervisory responsibility simply have an opportunity to observe more problems. Alternatively, these instructors' high incidence of reporting problems may stem from lack of specific training for their current roles. (Utility of training was positively related to liking for job, and this in turn was negatively related to the severity/frequency of problems reported.)

Finally, it is interesting to note that instructors' ratings of their jobs were negatively related to the frequency/severity of the problems they reported. Many of the issues dealt with in the problems questionnaire reflect feelings of alienation, depersonalization, and powerlessness. Instructors who rated their jobs highly also tended to rate their training for those jobs as highly useful. This finding suggests that training geared specifically to the instructors' roles in non-conventional instructional settings may help both to increase instructors' liking for their jobs and to decrease their negative feelings as they carry out their jobs. In addition, as has been suggested by Fullan and Pomfret (1977), in-service training, as opposed to a detached curriculum approach, may be the best training vehicle in that it provides instructors with demonstration models, experiences, and reinforcements conducive to positive instructor resocialization in their new roles and responsibilities in an NCI setting.

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APPENDIX A
INSTRUCTOR ROLES AND BEHAVIORS QUESTIONNAIRE

This questionnaire contains a listing of behaviors that instructors may perform in nonconventional instruction courses. In Part I, these behaviors are grouped under ten major instructor activities (or roles). What we would like you to do is to: (1) Read through the descriptions of all ten roles and check only those you perform as part of your regular job. (2) For those roles that you have checked, rate the amount of time you spend on each of these roles on a nine-point scale. A rating of 1 indicates that you spend very little time in a role compared to the other roles. A rating of 9 indicates that you spend a very large amount of your time in a role compared to the other roles you perform.

At the end of the list of ten roles, there are spaces for you to indicate other roles you spend time performing that are not included in the list. If there are other roles, also rate the amount of time you spend on each of these roles on a nine-point scale. For example, an instructor may respond as follows:

	Perform? Yes	Perform? No	Rating of Time (1 to 9)
1. Planner of Classroom Operation	___	___	_____
2. Implementor and Monitor	___	___	_____
3. Evaluator of Individual Student Performance	___	___	_____
4. Diagnostician of Individual Student Problems	___	___	_____
5. Counselor and Student Advisor	___	___	_____
6. Remediator of Student Learning Problems	___	___	_____
7. Behavior Modeler and Student Tutor	___	___	_____
8. Course Author and Evaluator	___	___	_____
9. Equipment Maintainer	___	___	_____
10. Course Supervisor	___	___	_____
11. Other _____	___	___	_____
12. Other _____	___	___	_____

Record your responses on this questionnaire. Remember, first go through Part I and check the roles you perform. Second, for those roles you perform, rate the amount of time spent on each from 1 to 9. Do not rate those roles you do not perform. When you finish Part I, go on to Part II.

PART I: MAJOR INSTRUCTOR ROLES

	Perform? Yes	No	Rating of Time (1 to 9)
1. Planner of Classroom Operation	___	___	_____
This instructor activity pertains to the planning of the overall operation of the classroom (or learning center), including decisions about appropriate student rewards, placement and frequency of group and individual activities, types of adaptive remediation strategies to be used in conjunction with available remediation procedures, and how lectures should be used.			
2. Implementor and Monitor	___	___	_____
This instructor activity pertains to the actual implementation of planned classroom procedures, and the monitoring of student performance and progress by frequent use of student progress reports and available data on student performance.			
3. Evaluator of Individual Student Performance	___	___	_____
This instructor activity pertains to evaluating the behavior of individual students (either through written tests, conversations with a student, or your own observations) and providing personal motivational feedback to individual students (e.g., sharing personal observations about a student's progress or change in performance).			
4. Diagnostician of Individual Student Problems	___	___	_____
This instructor activity pertains to diagnosing the learning problems of those students having difficulty in the course, including diagnosing their use of appropriate learning strategies and skills, motivational processes, and general coping skills.			
5. Counselor and Student Advisor	___	___	_____
This instructor activity pertains to counseling and advising students about their individual learning problems and appropriate strategies (both cognitive and affective) for dealing with these problems.			

	Perform? Yes	No	Rating of Time (1 to 9)
6. Remediator of Student Learning Problems	___	___	_____
This instructor activity pertains to helping students who are experiencing learning problems by selecting, prescribing, or administering various individualized strategies judged to be appropriate solutions to the particular type of learning problem.			
7. Behavior Modeler and Student Tutor	___	___	_____
This instructor activity pertains to modeling the practical use of new knowledge and skills, as well as modeling for students the concept of personal responsibility. This category also includes tutoring students having difficulty with specific course material, as well as tutoring students in areas of importance that fall outside the technical training curriculum (e.g., military topics).			
8. Course Author and Evaluator	___	___	_____
This instructor activity pertains to designing instructional strategies, writing course materials and test items, selecting instructional media, and evaluating and revising course materials and test items.			
9. Equipment Maintainer	___	___	_____
This instructor activity pertains to checking any course-related equipment to insure that it is operating correctly, performing authorized minor maintenance activities on media resources or computer equipment, and contacting maintenance personnel in the event of equipment failures.			
10. Course Supervisor	___	___	_____
This instructor activity pertains to such behaviors as replying to student critiques, selecting students for instructor aides, performing instructor evaluations, and a variety of other supervisory tasks.			
11. Other _____	___	___	_____
12. Other _____	___	___	_____

Directions for Part II

In this second part of this questionnaire, we would like you to rate the time you spend doing specific behaviors within each of the ten major instructor activities or roles. If you feel you are doing tasks within a certain role that are not mentioned, please write them down in the spaces provided. Notice also that there is a category of instructor behaviors called "Miscellaneous" at the end of Part II which may contain some of the other behaviors you perform in your job.

As in Part I, you will be rating the amount of time you spend on each behavior within the role categories. First, read through all the behaviors in each role category (all of Part II, pages 4-12) and check only those you perform as part of your regular job. Next, for those roles that you checked, go back and rate the amount of time you spend on each of these behaviors on a nine-point scale. A rating of 1 indicates that you spend very little time in that behavior as compared to the other behaviors in that role category. A rating of 9 indicates that you spend a very large amount of your time performing a behavior compared to the other behaviors in that role category. Record your responses directly on this questionnaire. Remember, you will first go through and check all the behaviors you perform in Part II. Second, you will go back and rate the amount of time you spend on only the behaviors you checked.

PART II: INSTRUCTOR BEHAVIORS

	Perform? Yes	No	Rating of Time (1 to 9)
Planner of Classroom Operation (Thinking about what to do.)			
1. Insure that instructional study materials are available for students.	___	___	_____
2. Insure that instructions for operating classroom equipment are available to students.	___	___	_____
3. Insure that critique forms or other required documents are available to students.	___	___	_____
4. Insure facilities have adequate light, heat, and other health/safety factors.	___	___	_____
5. Obtain instructional/study materials such as study guides, training equipment and training aids.	___	___	_____
6. Review lesson plans and instructional/study materials in preparation for class.	___	___	_____

	Perform? Yes	No	Rating of Time (1 to 9)
7. Establish classroom rules and discipline contingencies.	___	___	_____
8. Determine best way to arrange training area (classroom, learning center, lab, etc.) for required training activities.	___	___	_____
9. Determine plan for assigning work details to students.	___	___	_____
10. Determine plan for assigning students to carrels, labs, desks, etc.	___	___	_____
11. Determine what student incentives can be used and the criteria for awarding these incentives.	___	___	_____
12. Determine what instructional questions you want to study (e.g., effects of peer instruction) and set up experimental study.	___	___	_____
13. Design motivational status board or charts for tracking students' performance and progress.	___	___	_____
14. Establish plan for flexibly adjusting instructional sequence, methods, or media to meet individual student needs.	___	___	_____
15. Arrange for remote training assignments for students (e.g., field trips).	___	___	_____
16. Prepare your own personalized lesson plan from standard plan.	___	___	_____
17. Design alternative personalized remediation strategies for students who don't meet all course entry prerequisites.	___	___	_____
18. Other _____	___	___	_____
19. Other _____	___	___	_____

Implementor and Monitor (Carrying out plans that were made.)

1. Administer instructional plan and strategies as defined.	___	___	_____

	Perform? Yes	No	Rating of Time (1 to 9)
2. Distribute/account for training materials/ equipment.	___	___	___
3. Review student records to determine student performance/progress.	___	___	___
4. Circulate among students to observe student performance/progress.	___	___	___
5. Account for students (e.g., take attendance, monitor breaks).	___	___	___
6. Prepare students' counseling reports/records.	___	___	___
7. Maintain discipline in classroom/lab/learning center.	___	___	___
8. Demonstrate operation of training equipment and computer resources.	___	___	___
9. Retrieve course or student information from files; update and maintain files as necessary.	___	___	___
10. Follow-up to insure that students receive appropriate alternative treatments (modules) or strategies.	___	___	___
11. Maintain motivational charts or status board.	___	___	___
12. Monitor conduct of any experimental studies.	___	___	___
13. Follow flexible plans for course sequence, methods, or media to meet student needs.	___	___	___
14. Conduct student orientation to the course, including description of students' learning role in the self-paced environment.	___	___	___
15. Conduct types of lessons called for in lesson plan (performance, demonstration, discussion, lecture, team performance, training games, etc.).	___	___	___
16. Other _____	___	___	___
17. Other _____	___	___	___

Evaluator of Individual Student Performance

1. Evaluate students by means of performance types of tests during or at the end of the course.	___	___	___

	Perform? Yes	No	Rating of Time (1 to 9)
2. Evaluate students by means of oral tests during or at the end of course.	___	___	_____
3. Evaluate students by means of intelligence/aptitude/attitude tests.	___	___	_____
4. Praise or reward students for course successes, implementing planned incentive system.	___	___	_____
5. Provide motivational feedback to students concerning performance conditions that can lead to elimination from course.	___	___	_____
6. Make recommendations for actions such as elimination, discharge, proficiency advancements, etc.	___	___	_____
7. Intervene in the learning process to informally determine student progress.			
8. Conduct test critiques and interpret results with students.	___	___	_____
9. Evaluate students by means of written (e.g., multiple choice) tests.	___	___	_____
10. Other _____	___	___	_____

Diagnostician of Individual Student Problems

1. Talk to individual students who are having difficulty with the course to determine what kind of remediation is needed.	___	___	_____
2. Identify problem readers and make referrals to appropriate remediation.	___	___	_____
3. Assess (without testing) qualifications of new students by checking individual data available in the files.	___	___	_____
4. Assess (without testing) qualifications of new students by interviews.	___	___	_____
5. Make individualized student assignments or prescriptions on basis of diagnostic evaluations.	___	___	_____
6. Match students to media equipment or alternative strategies.	___	___	_____

	Perform? Yes	No	Rating of Time (1 to 9)
7. Obtain information on students having difficulty to determine type of remediation needed.	___	___	_____
8. Review/approve/disapprove recommendations for student recycle/disenrollment/proficiency advancement on basis of student diagnosis.	___	___	_____
9. Other _____	___	___	_____

Counselor and Student Advisor

1. Talk with and advise students about their training progress.	___	___	_____
2. Talk with and advise students about their learning difficulties.	___	___	_____
3. Talk with and advise students about their test failures.	___	___	_____
4. Talk with and advise students about their attitude/ motivation.	___	___	_____
5. Talk with and advise students about their personal problems.	___	___	_____
6. Talk with and advise students about any disciplinary problems.	___	___	_____
7. Talk with and advise students about their career field or career options.	___	___	_____
8. Follow-up on results of counseling students.	___	___	_____
9. Negotiate individualized learning plans or contracts with students.	___	___	_____
10. Help students assess and clarify their needs, interests, goals.	___	___	_____
11. Help students assess and clarify their personal learning styles and learning strategies.	___	___	_____
12. Help students use appropriate problem solving strategies for academic problems.	___	___	_____

	Perform? Yes	No	Rating of Time (1 to 9)
13. Help students use appropriate problem solving strategies for personal problems.	___	___	_____
14. Instruct and advise individual students in the use of effective learning skills and strategies.	___	___	_____
15. Refer major student problems to appropriate agencies.	___	___	_____
16. Other _____	___	___	_____

Remediator of Student Learning Problems

1. Determine which units, lessons, elements, etc., students must complete during remedial instruction.	___	___	_____
2. Prescribe individualized remedial action.	___	___	_____
3. Assign/shift/override students to tracks or modules based on previous performance, pretests, or records review.	___	___	_____
4. Assign remediation to students.	___	___	_____
5. Reassign poorly assigned students to appropriate remediation.	___	___	_____
6. Recommend students for out-of-course remedial activities (e.g., reading course) as required.	___	___	_____
7. Conduct remedial training for students on a one-to-one basis.	___	___	_____
8. Conduct remedial training for a group or groups of students.	___	___	_____
9. Instruct students on alternative learning strategies and study skills to use in remedial assignments.	___	___	_____
10. Follow-up and record results of individual remedial actions.	___	___	_____
11. Other _____	___	___	_____
12. Other _____	___	___	_____

	Perform? Yes	No	Rating of Time (1 to 9)
Behavior Modeler and Student Tutor			
1. Show students how to use official publications such as technical orders, regulations, and manuals.	___	___	_____
2. Show students behaviors required to adhere to various military standards and regulations.	___	___	_____
3. Show students how to be personally responsible by studying instructor or other job-related materials.	___	___	_____
4. Schedule group tutorial sessions over selected course or military topics.	___	___	_____
5. Conduct appropriate group learning experiences not called for by lesson plan (e.g., discussions, demonstrations, lectures, performances, etc.).	___	___	_____
6. Other _____	___	___	_____
7. Other _____	___	___	_____
Course Author and Evaluator			
1. Write objectives and test items.	___	___	_____
2. Write instructional materials.	___	___	_____
3. Critique courseware (study guides, audio-visuals, programmed texts, etc.) for clarity, technical accuracy, etc.	___	___	_____
4. Evaluate written tests and suggest/make revisions.	___	___	_____
5. Evaluate performance checks and make revisions.	___	___	_____
6. Write/revise student orientation materials and study guides.	___	___	_____
7. Develop/revise plans of instruction.	___	___	_____
8. Design, sketch, compose, or advise on manuscript illustrations.	___	___	_____
9. Prepare/revise audio-visual scripts.	___	___	_____

		Perform? Yes	No	Rating of Time (1 to 9)
10.	Design slides or transparencies.	___	___	_____
11.	Conduct small group formative evaluations/tryouts of materials.	___	___	_____
12.	Conduct large group summative evaluations/tryouts of materials.	___	___	_____
13.	Maintain files of material development and evaluation procedures.	___	___	_____
14.	Develop lists of items to be trained.	___	___	_____
15.	Design or assist in designing/revising trainers/ simulators.	___	___	_____
16.	Interview/work with subject matter specialists.	___	___	_____
17.	Construct job inventory questionnaires/checklists.	___	___	_____
18.	Develop training plans (detailed descriptions of proposed course to include resource requirements, purposes, etc.).	___	___	_____
19.	Develop course charts and project evaluation plans.	___	___	_____
20.	Correlate training control documents with field survey data, such as occupational survey reports.	___	___	_____
21.	Perform photography for curriculum developers.	___	___	_____
22.	Develop guidelines and checklists for resident course reviews.	___	___	_____
23.	Draft organization and functional charts.	___	___	_____
24.	Prepare course announcements for publication.	___	___	_____
25.	Develop/supplement course instructor guide.	___	___	_____
26.	Other _____	___	___	_____

	Perform? Yes	No	Rating of Time (1 to 9)
Equipment Maintainer			
1. Insure periodic inspections of audio-visual equipment are current.	___	___	_____
2. Contact maintenance personnel when equipment malfunctions.	___	___	_____
3. Shut down and secure equipment.	___	___	_____
4. Perform operational checks of equipment.	___	___	_____
5. Perform authorized minor maintenance on equipment.	___	___	_____
6. Other _____	___	___	_____
7. Other _____	___	___	_____
8. Other _____	___	___	_____
Course Supervisor			
1. Conduct orientations/tours for visitors.	___	___	_____
2. Recommend students for duty as class leaders.	___	___	_____
3. Review/approve curriculum materials during development/revision.	___	___	_____
4. Orient instructors as to their role in the instructional environment.	___	___	_____
5. Assign personnel to duty positions.	___	___	_____
6. Conduct formal on-the-job training.	___	___	_____
7. Evaluate grading practices.	___	___	_____
8. Determine personnel requirements and person-hour records.	___	___	_____
9. Conduct/schedule instructor in-service training sessions.	___	___	_____
10. Perform instructor evaluations.	___	___	_____

	Perform? Yes	No	Rating of Time (1 to 9)
11. Complete instructor proficiency records.	___	___	_____
12. Select and/or train instructor aides.	___	___	_____
13. Draft replies to student critiques.	___	___	_____
14. Certify personnel for instructor duty.	___	___	_____
15. Prepare planned graduation activities.	___	___	_____
16. Select, as instructors, recent course graduates.	___	___	_____
17. Select persons other than recent course graduates for instructor duty.	___	___	_____
18. Recommend/approve training budget.	___	___	_____
19. Other _____	___	___	_____
20. Other _____	___	___	_____

Miscellaneous Behaviors

1. Score tests and keep manual record of test scores.	___	___	_____
2. Check student test forms, worksheets, and administrative data forms.	___	___	_____
3. Maintain stock files of resident training materials.	___	___	_____
4. Select/approve students for instructor aides.	___	___	_____
5. Initiate recommendations for changes in career specialty descriptions.	___	___	_____
6. Prepare training activity reports.	___	___	_____
7. Develop course flow diagrams.	___	___	_____
8. Develop module flow diagrams.	___	___	_____
9. Enter student into the course.	___	___	_____

	Perform? Yes	No	Rating of Time (1 to 9)
10. Correct for lost training time of individual students students.	___	___	_____
11. Other _____	___	___	_____
12. Other _____	___	___	_____
13. Other _____	___	___	_____
14. Other _____	___	___	_____

Your answers on the next two questions will be used for research only; they will not be used together with your name nor in any way to connect you with the answers. (Check ONE box in each column.)

I find my job:
_____ extremely dull
_____ very dull
_____ fairly dull
_____ so-so
_____ fairly interesting
_____ very interesting
_____ extremely interesting

My job utilizes my talents and training:
_____ not at all
_____ very little
_____ fairly well
_____ quite well
_____ very well
_____ excellently
_____ perfectly

APPENDIX B
POTENTIAL PROBLEMS IN PERFORMING INSTRUCTOR ROLES QUESTIONNAIRE

Conditions exist in every instructional system that students, instructors, administrative personnel, or others consider to be a problem. Below are listed potential sources of difficulty; please indicate to us <u>how often</u> each item is a problem, and <u>how major</u> the problem is when it occurs. If you respond that an item <u>is not</u> a problem, do not indicate how major the problem is. Indicate how major the problem is only for those items you rate as a problem from 2 to 5. At the end of this section there is blank space for you to list other problems not included here. Record your answers on this questionnaire.

Part I	How often a problem?					How major a problem?				
	Not At All	Rarely	Often	Frequently	Almost Always	Not At All	Minor	Somewhat Major	Fairly Major	Major
1. My job is too mechanical in this instructional system.	1	2	3	4	5	1	2	3	4	5
2. The instructional system used in this classroom isolates students from each other too much.	1	2	3	4	5	1	2	3	4	5
3. The instructional system used in this classroom provides me with so much information on students that I don't know how to use it.	1	2	3	4	5	1	2	3	4	5
4. I have too little chance to interact with students and other instructors in this type of instructional system.	1	2	3	4	5	1	2	3	4	5
5. My job as instructor seems relatively unimportant.	1	2	3	4	5	1	2	3	4	5
6. I have had a hard time changing the way I teach to fit the demands of the instructional system used in this classroom.	1	2	3	4	5	1	2	3	4	5
7. The instructional system used in this classroom isolates me as an instructor too much from my students.	1	2	3	4	5	1	2	3	4	5

		How often a problem?					How major a problem?				
		Not At All	Rarely	Often	Frequently	Almost Always	Not At All	Minor	Somewhat Major	Fairly Major	Major
8.	The instructional system used in this classroom allows little leeway for personal instructor styles.	1	2	3	4	5	1	2	3	4	5
9.	This system is unrewarding for me as an instructor to work in.	1	2	3	4	5	1	2	3	4	5
10.	I don't ever know why school management makes the decisions they do.	1	2	3	4	5	1	2	3	4	5
11.	The student information that the instructor receives from the system doesn't help the instructor to deal with specific student problems.	1	2	3	4	5	1	2	3	4	5
12.	The school management doesn't ask for instructor input when making policy decisions.	1	2	3	4	5	1	2	3	4	5
13.	There is *no* payoff for instructors working in this system.	1	2	3	4	5	1	2	3	4	5
14.	I feel that school management collects data on me (or my students) just to catch me making mistakes.	1	2	3	4	5	1	2	3	4	5
15.	The school management really doesn't know what kinds of problems we instructors have to deal with.	1	2	3	4	5	1	2	3	4	5
16.	I'm not certain how to perform my job as instructor in this instructional system.	1	2	3	4	5	1	2	3	4	5
17.	It's been hard for me to adapt to the self-paced instructor roles required in this classroom.	1	2	3	4	5	1	2	3	4	5
18.	The instructor in this instructional system has little control over the educational process: The system dictates what will be done and when.	1	2	3	4	5	1	2	3	4	5

	How often a problem?					How major a problem?				
	Not At All	Rarely	Often	Frequently	Almost Always	Not At All	Minor	Somewhat Major	Fairly Major	Major
19. I feel like I can't get anything changed around here.	1	2	3	4	5	1	2	3	4	5
20. Students are pushed to work too fast in this instructional system.	1	2	3	4	5	1	2	3	4	5

Part I.a.

Please list below any problems that you feel feel were not addressed in the previous section. Also, please rate them according to the same scales: How often are they a problem, and How major a problem are they when they occur?

	How often a problem?					How major a problem?				
1.	1	2	3	4	5	1	2	3	4	5
2.	1	2	3	4	5	1	2	3	4	5
3.	1	2		4	5	1	2	3	4	5

Part II	How often a problem?					How major a problem?				
	Not At All	Rarely	Often	Frequently	Almost Always	Not At All	Minor	Somewhat Major	Fairly Major	Major
1. This instructional system needs more and better staff/clerical support than is currently available.	1	2	3	4	5	1	2	3	4	5
2. There are too few instructors for the number of students in my classroom.	1	2	3	4	5	1	2	3	4	5
3. I don't really know what to do about students who don't have the necessary basic academic skills for this course.	1	2	3	4	5	1	2	3	4	5
4. I don't really know how to motivate students who seem to have no direction.	1	2	3	4	5	1	2	3	4	5
5. This classroom needs better methods for dealing with disciplinary problems.	1	2	3	4	5	1	2	3	4	5
6. Too much instructional time is taken up handling students with basic academic deficiencies.	1	2	3	4	5	1	2	3	4	5
7. Too much instructional time is taken up handling students with motivational problems and bad attitudes.	1	2	3	4	5	1	2	3	4	5
8. Too much instructional time is taken up handling students with disciplinary problems.	1	2	3	4	5	1	2	3	4	5
9. Too much of my time is spent in administrative, clerical, or other noninstructional duties.	1	2	3	4	5	1	2	3	4	5
10. This classroom has a chronic lack of equipment needed to support the program of instruction.	1	2	3	4	5	1	2	3	4	5
11. Equipment breakdowns occur which seriously affect student progress.	1	2	3	4	5	1	2	3	4	5
12. Broken equipment takes too long to fix.	1	2	3	4	5	1	2	3	4	5

		How often a problem?					How major a problem?				
		Not At All	Rarely	Often	Frequently	Almost Always	Not At All	Minor	Somewhat Major	Fairly Major	Major
13.	The classroom facilities are too hot/too cold/too noisy.	1	2	3	4	5	1	2	3	4	5
14.	The layout of the classroom (arrangement of desks, carrels, etc.) doesn't fit the requirements of the instructional system.	1	2	3	4	5	1	2	3	4	5
15.	This classroom is unsafe for the type of course being presented.	1	2	3	4	5	1	2	3	4	5
16.	There isn't enough space in the classroom to get the job done.	1	2	3	4	5	1	2	3	4	5
17.	Test security has been a problem in this classroom.	1	2	3	4	5	1	2	3	4	5
18.	I have to spend too much time correcting errors in the instructional materials or tests.	1	2	3	4	5	1	2	3	4	5
19.	The instructional materials are too difficult	1	2	3	4	5	1	2	3	4	5
									5		
20.	The instructional materials and/or tests are confusing to students.	1	2	3	4	5	1	2	3	4	5

Part II.a.

	How often a problem?					How major a problem?				
	Not At All	Rarely	Often	Frequently	Almost Always	Not At All	Minor	Somewhat Major	Fairly Major	Major

Please list below any problems that you believe were not addressed in the previous section. Also, please rate them according to the same scales: How often are they a problem, and How major a problem are they when they occur?

1.	1	2	3	4	5	1	2	3	4	5
2.	1	2	3	4	5	1	2	3	4	5
3.	1	2	3	4	5	1	2	3	4	5
4.	1	2	3	4	5	1	2	3	4	5

APPENDIX C

BIOGRAPHICAL AND BACKGROUND INFORMATION

Code Number: _____

Course: _____ Section: _____

Format: _____ Job Title: _____

Base: _____ Date: _____

Branch of Service: _____ Military: _____ Civilian: _____

Length of Time in Service:

_____
years months

Length of Time as Self-Paced Instructor

_____
years months

Current Job:

_____ _____ _____
Self-Paced Instructor Group-Paced Instructor Lock Step Instructor

Length of Time as Group-Paced Instructor

_____
years months

Length of Time as Lock Step Instructor

_____
years months

List Any Instructor Training Courses You Have Taken (for example, ISD, Test and Measurement, Teaching Individualized Instruction Courses, Counseling, Effective Writing, Programmed Text Writing, etc.)

_____

_____

_____

_____

_____

Was Instructor Training:

_____ resident, pre-service
_____ resident, in-service
_____ OJT
_____ other (for example, college, ECI, correspondence, etc.)
Please indicate: _____

Type of Instructor Training Course:

_____ traditional
_____ self-paced (noncomputer)
_____ computer-assisted
_____ computer-managed
_____ other; Please indicate: _____

END

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