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Rating Training Continuum: Evaluation Plan

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The Deputy Chief of Naval Operations (Manpower, Personnel and Training (OP-01) tasked Navy Personnel Research and Development Center (NPRDC) to construct a training continuum design methodology using the Operations Specialist (OS) and Electronics Warfare Technician (EW) ratings as the design vehicles. Rating Training Continuum Development Workshops were held for the OS and EW ratings in FY89 and FY90. The results of the workshops were incorporated into Continuum Training Plans (CTPs). NPRDC then developed an evaluation plan to determine the effectiveness of the OS and EW CTPs. The first step in the evaluation is to verify that the recommendations in the CTPs have been implemented into the OS and EW training pipelines. Implementation will be established by surveying the implementing and using agencies, and examining course materials. The second step in the evaluation is to measure the effect of the recommendations on OS and EW personnel and on their training pipelines. Four attributes will be measured: Job performance, force structure, training effectiveness, and career attitude. Existing organizational data, surveys, and interviews will be used to obtain the necessary data on the attributes. Descriptive and inferential statistics will be used to analyze the data.

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FOREWORD

This evaluation plan was written under the Career Systems Design (CSYD) project of the Education and Training Function Program Element 0603720N. The work is sponsored by the Deputy Chief of Naval Operations (OP-111J).

The CSYD project, which was conceived using a systems approach to career implementation, preparation, and development, was tasked to design a rating training continuum design methodology. The resultant methodology was applied to the Operations Specialist (OS) and the Electronics Warfare Technician (EW) ratings. Continuum training plans were completed for both ratings.

The plan presented here is intended to be used to evaluate the effectiveness of the OS and EW continuum training plans. The plan addresses four attributes: Job performance, force structure, training effectiveness, and career attitude.

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SUMMARY

Background and Problem

The Deputy Chief of Naval Operations (Manpower, Personnel and Training (OP-01) tasked Navy Personnel Research and Development Center (NPRDC) to construct a rating training continuum design methodology using the Operations Specialist (OS) and Electronics Warfare Technician (EW) ratings as the design vehicles. Rating Training Continuum Development Workshops were held for the OS and EW ratings in FY89 and FY90. The results of the workshop were incorporated into Continuum Training Plans (CTPs) and published in FY91.

The Continuum Development Office (OP-111J) needed a plan to evaluate the effects of the CTPs on the training pipelines of the OS and EW ratings.

Objective

The objective of this effort was to design a plan to evaluate the effectiveness of the OS and EW CTPs.

Evaluation Method

The first step in the evaluation of the CTPs is to verify that the recommendations in the CTPs have been implemented into the OS and EW training pipelines. Implementation will be established by surveying the implementing and using agencies, and examining course materials.

Once implementation has been established, it will be possible to measure the effect that the recommendations have had on OS and EW personnel, and on the training pipelines. Four attributes will be measured: Job performance, force structure, training effectiveness, and career attitude. Existing organizational data, surveys, and interviews will be used to obtain the necessary data on these four attributes. Descriptive and inferential statistics will be used to analyze the data.

Recommended Evaluation Plan

The evaluation plan identifies the variables and the procedures necessary to evaluate the effectiveness of the OS and EW CTPs. If the recommendations in the CTPs have not been implemented, the evaluation must be discontinued.

Baseline data should be collected immediately. Evaluation data should be collected after completion of two or more evolutions of the courses revised as a result of the CTPs. Evaluation data gathered too soon will not reflect the changes in the training pipeline.

Data should be gathered at regular intervals following the initial evaluation to determine the continuing effect of the recommendations across a 30-year career.

The tasks that need to be completed are listed below:

1. **First Year**

    a. Identify, collect, and analyze existing baseline data immediately.
    b. Develop and administer surveys to obtain data not currently available.
    c. Process and analyze survey data.
    d. Combine all baseline data for comparison purposes.
    e. Submit report on baseline data to OP-111J.

2. **Second Year**

    a. Verify implementation of OS and EW CTPs using implementation variables.
    b. Collect and analyze existing organizational data on evaluation variables.
    c. Administer surveys to obtain data not currently available.
    d. Process and analyze survey data.
    e. Compare evaluation data to baseline data.
    f. Report results to OP-111J.

CONTENTS

LIST OF TABLES

INTRODUCTION

Background and Problem

In 1983, a Navy Inspector General (NAVINSGEN) identified several training areas that needed improvement. Specifically, improvement was needed in the communications between the fleet and school commands, in the training community's response time to fleet comments, and in the agreement between the fleet-required skills and knowledge, and the school curriculum. The rating training continuum concept evolved when senior Navy decision makers concluded that no cohesive and comprehensive plan for training requirements existed across the career of enlisted personnel. The Navy Training Strategy (Office of Chief of Naval Operations, 1989) directed the Deputy Chief of Naval Operations (Manpower, Personnel and Training (OP-01)) to coordinate the application of a continuum approach to rate and mission area training. The training continuum concept establishes career training requirements and provides an appropriate and timely mix of formal school, on-board training, and sea and shore assignments.

The Navy Personnel Research and Development Center (NPRDC) was tasked to construct a training continuum design methodology using the Operations Specialist (OS) and Electronics Warfare Technician (EW) ratings as the design vehicles. The continuum training concept requires the participation of current fleet experienced rating qualified subject matter experts (SMEs) to develop the continuum training plan (CTP). A workshop was determined to be the most effective means of bringing the SMEs together and obtaining the necessary information.

To date, there have been two rating training continuum development workshops. The first was for the OS rating; and the second, for the EW rating. During each workshop, the SMEs developed training requirements in the form of personnel performance profiles (PPPs), training level assignments (TLAs), and a complete training pipeline. All the information was then incorporated into a separate CTP for each rating.

The Career System Design (CSYD) rating training continuum effort is nearing completion with only two remaining development phases. They are the implementation and evaluation phases. To assist the Continuum Development Office (OP-111J) in conducting the evaluation phase, an evaluation planning document needed to be developed.

Objective

The objective of this effort was to design a plan to evaluate the effectiveness of the OS and EW CTPs.

EVALUATION METHOD

The objective of an evaluation plan is to define and develop a realistic program to determine the effectiveness of a particular program or intervention. In this case, the intervention consists of the recommendations in the OS and EW CTPs. Before an evaluation can take place, it is necessary to verify that the recommendations made in the CTPs have been implemented. Hence, the evaluation must first verify that the recommendations in the CTPs have been implemented and then

1

measure the effect that the recommendations have had on OS and EW personnel, and on the training pipelines.

Design

To evaluate the effectiveness of the OS and EW CTPs, a plan to obtain data on the attributes must be established. An "experimental design" specifies a plan for assigning subjects to experimental conditions and the statistical analysis to be used in measuring the results. True experimental designs have control groups and full experimental control of both the subjects and their exposure to the intervention. In this evaluation, all of the subjects will be exposed to the intervention, the recommendations in the CTP, and there will be no control group. The subjects will not be in a controlled laboratory environment, but in the field. In addition, the subjects will be exposed continually to the changes. Exposure to the intervention will not be an isolated event. Because of these constraints, a quasi-experimental design is best suited to this evaluation.

The most appropriate quasi-experimental design for this evaluation is the time-series design. In the time-series design, the attributes of a particular subject group are observed or measured over time, exposed to the intervention, and then the same attributes are measured again over time to determine the effects of the intervention. The time-series design assumes that the exposure to the intervention is ongoing after the initial exposure, as in this evaluation. It also assumes that group members, although subject to change, retain the same characteristics. The time-series design provides the level of detail and scope required to gain a comprehensive understanding of the attributes (Campbell & Stanley, 1966).

Because of real-world compromises imposed by time, funding, and data gathering constraints, this evaluation will concentrate on the most useful variables. The evaluation will include surveys dedicated to measuring the criterion variables, database development and analysis, and analysis of organizational data. These three techniques will provide a multifaceted approach to the evaluation.

Implementation Measurement

Implementation is "a critical process in the life-cycle of a new program" (Gray, 1984). "The concept of degree of implementation is critical in order to derive valid conclusions from both outcome and process studies of social and technological innovations" (Scheirer & Rezmovic, 1983) Without empirical evidence of the degree to which program components have been implemented, the evaluator of an innovative program will have difficulty in determining the outcome of the intervention.

There are three levels of implementation. The weakest level, adoptive implementation, refers to 'he process surrounding an organization's decision to try out the innovation. The next level, adaptive implementation, refers to changes that the innovation requires to improve the fit with the user environment. Finally, the most robust level, programmed implementation, refers to changes that the user environment requires for the innovation to be used routinely (Scheirer & Rezmovic 1983). To be effective, the OS and EW CTPs must achieve programmed implementation.

Based on the Training Path Charts (TPCs) developed during the OS and EW workshops, and amended by fleet review, specific recommendations were incorporated into the continuum training

2

plans of the two ratings. To determine the degree of implementation, it will be necessary to ascertain whether the recommendations have been implemented. This will involve obtaining information from the implementing and using agencies through survey and organizational data. The information will provide an implementation audit trail, as well as determining the degree of implementation.

After the CTPs have been formally approved, the recommendations will be implemented. However baseline data should be collected immediately so that they will be available for comparison with the data collected after implementation.

Table 1 lists the changes recommended to the OS training path made in the OS CTP and approved by fleet and schoolhouse review.

Table 2 lists changes recommended to the EW training path made in the EW CTP and approved by the fleet and schoolhouse.

Table 1

OS Training Path System: Recommended Changes (as of Oct 1990)

Recommended Action	Implementing Activity	Using Activity	Outcome
Require OS intermediate and advanced courses	PERS	FCTCs	New courses Revised pipeline
Increase ASAC entry level from E-5 to E-6	PERS	FCTCs	Revised pipeline
Increase ASAC warfare tactical training	CNET	PLATFORMS	Revised course and on-board training
Use OS watchstanding skills as PCS refresher	PERS	FCTCs	Revised pipeline
Develop 5 new PQS items	CNET	PQSDEVGRU	New PQS modules
Reduce length of AICS course	CNET	FCTCs	Revised course
Develop MCM navigation equipment operator course	CNET	FLEMINE WARTRACEN	New course
Introduce AEGIS NTDS in "A" school	CNET	FCTCLANT and AEGISTRACEN	Revised course
Increase IFF training	CNET	FCTCs	Revised courses

Note. See Glossary for definition of all acronyms.

Table 2

EW Training Path System: Recommended Changes (as of Jan 1991)

Recommended Action	Implementing Activity	Using Activity	Outcome
Add journeyman operations training	OP-392C	CNET/CNTECHTRA, COMTRALANT, COMTRAPAC	New course
Shift ECCM from EWO to CICO/FCO	OP-762E	Fleet	Revised pipeline
Remove NEC 1781 from ships not staff capable	PERS-22C6	Fleet	Revised pipeline
Change NEC 1781 minimum prerequisite from E-6 to E-7	CNET/ Corry Sta.	CNET	Revised pipeline
Untruncate the pipeline	PERS-22C6	Fleet	Revised pipeline
Add journeyman maintenance course	OP-392C	CNET	New course
Add AEGIS integration to AN/SLQ-32 basic operations course	OP-392C	CNET, COMTRALANT, COMTRAPAC	Revised course
Add Mk-36 Decoy Launching Maintenance training to 4YO	OP-392C/ PERS-22C6	CNET	Revised course
Move 6YO advancement to the end of AN/SLQ-32 basic operations course	OP-392C/ OP-392C6	CNET	Revised courses

Note. See Glossary for definition of all acronyms.

Evaluation Variables

Once implementation has been established by surveying the implementing and using agencies, and examining the course materials, the evaluation can begin. An evaluation measures certain attributes that reflect the changes in the rating before and after implementation and determines the effectiveness of the rating training continuum concept. This evaluation will measure the following four attributes: Job performance, force structure, training effectiveness, and career attitude (*Training Continuum*, 1990). Cost attributes are not included in the evaluation plan because they take specialized expertise to interpret. Each attribute consists of a number of variables, each of which measures training continuum policy as well as diverse evaluation viewpoints. Their function is to provide measurable attributes relating continuum policy and program effectiveness.

A complete list of the possible variables and the criteria used to select them appear in Appendixes A and B respectively.

The job performance variables listed in Table 3 were selected to determine the proficiency of the individual. They indicate whether or not the revised training pipeline is producing a more effective sailor.

Table 3

Job Performance Variables

Variable	How Measured	Instrument
Supervisor confidence	Extent work meet;/exceeds supervisor expectation	Interview and/ or survey
Skill level	Performance level attained by paygrade	Surveys
Supervision	Amount of supervision required	Surveys
PQS progress	PQS performance	Surveys
Time on task	Percent time spent performing tasks	Surveys
Recommendation for advancement	Supervisors stated recommendation	Surveys

Note. See Glossary for definition of acronyms.

The force structure variables listed in Table 4 have been selected because of their importance to the specific rating. They highlight the personnel resource climate confronting the OS/EW rating detailers and the fleet they serve. Various management options such as massive force reduction will also affect these components.

Table 4

Force Structure Variables

Variable	How Measured	Instrument
Personnel acquisition	Number of acquisitions	Recruitment
Assignment	Number of billets filled by command	Manpower database
Distribution of personnel	Number of personnel by paygrade	Personnel database
Turbulence	Number of personnel assigned to I CSs/TDYs	Manpower database
Attrition	Number of personnel leaving Navy before EAOS	Manpower database
Retention	Number of reenlistments	Manpower database
Advancement	Number of personnel eligible for advancement	Manpower database

Note. See Glossary for definition of all acronyms.

The training effectiveness variables listed in Table 5 were selected to address questions of change in school, curriculum, and general student academic performance. They were selected to determine the impact that continuum recommendations have on the overall training environment. Numerous databases are available including TRAINTRACK (Nakada, Milczewsky, & Wax, 1989) and the Enlisted Master Record (EMR).

Table 5

Training Effectiveness Variables

Variable	How Measured	Instrument
Curriculum revision	Verify course Changes	New curriculum
Course length	Check course syllabus changes and schedule	TRAINTRACK
Course prerequisites	Verify required experience and paygrade	Course syllabus
Training attrition	Number of attrites	TRAINTRACK
Training backlog	Number of days awaiting school	TRAINTRACK
Setbacks	Number of academic setbacks	TRAINTRACK
Training interruptions	Number of interruptions	TRAINTRACK
NECs awarded	CDPs and number of NECs and graduates	TRAINTRACK
Course graduates	Number of graduates	TRAINTRACK
Average paygrade	Compute average paygrade	TRAINTRACK
Average number on-board	Compute average on-board	TRAINTRACK

Note. See Glossary for definition of all acronyms.

The career attitude variables listed in Table 6 are relatively soft; that is, they are based on feelings, opinions, and intentions rather than on performance. They are easily affected by personal and environmental changes.

Table 6

Career Attitude Variables

Variable	How Measured	Instrument
Job satisfaction	Statistical analysis of survey data	Survey
Commitment	Statistical analysis of survey data	Survey

Data Collection

Both implementation and evaluation measurement require numerical and categorical data. Most studies assessing the degree of implementation use more than one measurement technique. Dominant techniques include: interviews, surveys, and existing databases (Babbie, 1973).

Interviews

There are several issues to consider when conducting interviews. The selection of a suitable interviewer for the task is extremely important in establishing and maintaining respondent and agency confidence. The interviewer must also be able to illicit the required information without biasing the respondent or interfering with ongoing activities. In addition, it will be important to this evaluation to maintain cooperation between all concerned personnel because repeated contacts will be necessary. This evaluation will use face-to-face, group, and telephone interviews.

Face-to-face and group interviews permit good subject introduction, stimulation of new ideas, and convenient interaction and have a high response rate (from 80% to 85%).

Telephone interviews are inexpensive since they minimize travel and "no-answers" can be called back. Respondents may also be more candid over the telephone. In addition, there is better access to senior staff members. However, the fact that respondents can tire during lengthy calls can introduce inaccuracies.

Surveys

Mailed surveys are normally inexpensive to administer. They can deal with a large range of questions but often have a relatively low response rate (from 50% to 60%). The estimated response rate will affect how many surveys will be sent to the fleet. Another consideration in this evaluation is that before a survey can be sent to the fleet, a Report Control Symbol must be obtained. To apply for a Report Control Symbol, the survey instrument must be completed, and the sample population identified. The time involved in completing the paperwork and receiving approval must be included in the time allotted for developing a survey.

Database Review

Several comprehensive databases available at NPRDC can provide data for pre- and post-continuum implementation comparisons. Searching available databases is less intrusive to the Navy commands and a more cost effective and efficient way of obtaining the information.

TRAINTRACK (Nakada et al.,1989) contains the longitudinal record of training for each individual (service attrites, officers, and enlisted personnel from all services) dating back to 1979. These data are collected at the end of each fiscal year from the Student Master File (SMF), Survival Tracking File (STF), and CNET cost files for individuals who attended a school that reports to the Navy Integrated Resources and Administration System (NITRAS).

The Catalog of Navy Training Courses (CANTRAC) contains information on Navy schools and courses. CANTRAC provides a consolidated and computerized catalog presenting courses in a standardized format. The data include course descriptions, convening schedules, course

prerequisites, and locations. In some cases, CANTRAC also provides the skill profiles associated with the courses.

The EMR contains career information for every enlisted individual in the Navy. The EMR provides personal and service data, education and school history, classification codes, duty preferences as well as rate and rating information.

The Navy Personnel Survey Database contains attitudinal information on job satisfaction, organizational climate, training and education programs, and other career related issues.

Subjects

For the variables that are not available from an existing database, it will be necessary to obtain the information through interviews and/or surveys. The subjects who are surveyed or interviewed must be the key operational personnel most capable of answering individual performance and rating-specific questions.

Tables 1 and 2 identify the implementing and using agencies that will be affected by the OS and EW CTPs. To determine if the recommendations in the OS and EW CTPs were implemented, personnel from the agencies listed in Tables 1 and 2 will be surveyed or interviewed regarding the criterion variables.

To determine the effectiveness of the OS and EW CTPs, fleet personnel as well as personnel associated with the specific agencies identified in Tables 1 and 2 will be surveyed or interviewed. *Survey candidates will include those whose training pipelines were affected by the* recommendations in the CTPs. To obtain information on their job proficiency, the supervisors of those affected by the CTPs will also be interviewed/surveyed. Both TRAINTRACK and the EMR databases will be useful in identifying individuals who completed the affected courses, before and after implementation of the CTPs.

To survey all of the approximately 13,000 OSs and 3,000 EWs, and their supervisors would require a considerable investment of both time and resources. To avoid this, a random sample of individuals that represent the entire population will be selected. In this case, a sample consisting of 10 percent of the rating population is the minimum number of subjects required to provide a representative sample (Gay, 1976). Because surveys often have a low response rate, the sample size will be 20 percent, to ensure that the sample is not too small to generalize to the total population.

In order to make comparisons and draw conclusions about the effectiveness of the OS and EW CTPs, the sample of fleet and agency personnel will be interviewed or surveyed before the CTPs are implemented and after implementation has been verified.

Data Analysis

Evaluating the OS and EW CTPs will involve analyzing many aspects of the program. The most appropriate methods for analyzing the evaluation data are descriptive and inferential

8

statistics. Both methods exhibit useful and achievable traits applicable to the analysis of the performance criteria for the OS and EW continua (Tables 3 through 6).

Descriptive statistics organize and summarize data to describe the nature of a population. Descriptive statistics generally consist of measures of frequency, location, and variability (Campbell & Stanley, 1966; Kirk, 1968). Descriptive data are usually collected through surveys or interviews. In this evaluation, the most useful descriptive statistics will be means and standard deviations.

Inferential statistics use statistical information derived from a sample population to draw conclusions about the nature of the entire population from which the sample was drawn. The most useful tests of significance will be t-tests, and analyses of variance.

RECOMMENDED EVALUATION PLAN

Table 7 lists the tasks needed to evaluate the effectiveness of the OS and EW CTPs and a suggested time line.

Table 7

Evaluation Sequence

Fiscal Year	1QTR	2QTR	3QTR	4QTR
First Year				
Identify resources for baseline data	--			
Collect existing baseline data		--		
Analyze existing baseline data		--		
Develop survey instruments			--	
Administer survey instruments			--	
Process survey responses				--
Analyze survey data				--
Combine all baseline data				--
Submit report on baseline data to OP-111J				--
Second Year				
Verify implementation of OS and EW CTPs using implementation variables	--	--		
Collect existing data on evaluation variables		--		
Analyze existing data on evaluation variables			--	
Administer survey instruments		--		
Process survey responses			--	
Analyze survey data				--
Compare evaluation data to baseline data				--
Report results				--

The evaluation plan has identified the variables and the procedures necessary to determine if the recommendations in the OS and EW CTPs have been implemented. It has also identified the variables and the procedures necessary to evaluate the effectiveness of the OS and EW CTPs. If the recommendations in the CTPs have not been implemented, the evaluation must be discontinued.

Baseline data should be collected immediately. Evaluation data should be collected after completion of two or more evolutions of the courses revised as a result of the CTPs. If evaluation data are gathered too soon they will not reflect the changes in the training pipeline. Data should be gathered at regular intervals following the initial evaluation to determine the continuing effect of the recommendations across a 30-year career.

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GLOSSARY

AEGIS	Advanced Navy Surface-to-Air Missile System
AEGISTRACEN	AEGIS Training Center
AICS	Air Intercept Controller Supervisor
ASAC	Anti-Submarine Air Controller
CANTRAC	Catalog of Navy Training Courses
CDP	Course Data Processing Code
CICO	Combat Information Control Officer
CNET	Chief of Naval Education and Training
CNTECHTRA	Chief of Naval Technical Training
COMTRALANT	Commander, Training Command, U.S. Atlantic Fleet
COMTRAPAC	Commander, Training Command, U.S. Pacific Fleet
CSYD	Career Systems Design
CTP	Continuum Training Plan
EAOS	Expiration of Active Obligated Service
ECCM	Electronic Counter-countermeasures
EMR	Enlisted Master Record
EW	Electronics Warfare Technician
EWO	Electronics Warfare Officer
FCO	Fire Control Officer
FCTC	Fleet Combat Training Center
FCTCLANT	FCTC Atlantic
FCTCPAC	FCTC Pacific
FLEMINE WARTRACEN	Fleet Mine Warfare Training Center
IFF	Identification Friend or Foe
MCM	Mine Countermeasures
NAVINSGEN	Navy Inspector General
NEC	Navy Enlisted Classification code
NITRAS	Navy Integrated Resources and Administration System
NPRDC	Navy Personnel Research and Development Center
NTDS	Navy Tactical Data System
OS	Operations Specialist
PCS	Permanent Change of Station
PERS	Bureau of Naval Personnel
PPP	Personnel Performance Profile

PQS	Personnel Qualification Standards
PQSDEVGRU	PQS Development Group
SME	Subject Matter Expert
SMF	Student Mater File
STF	Survival Tracking File
TDY	Temporary Duty Assignment
TLA	Training Level Assignment
TPC	Training Path Chart
TRAINTRACK	Enlisted Training Tracking File
4YO	Four-year obligation
6YO	Six-year obligation

APPENDIX A

DEFINITION OF POSSIBLE EVALUATION VARIABLES

DEFINITION OF POSSIBLE EVALUATION VARIABLES

Job Performance

Supervisor confidence. Extent to which an individual's work performance meets a supervisor's expectations on rating specific and nonrating specific tasks.

Skill level. Performance level attained by paygrade.

Supervision. Amount of supervision required by an individual in performing assigned tasks.

PQS progress. Extent to which an individual completes PQS requirements.

Time on task. Time spent on various categories of rating and nonrating specific tasks.

Recommendation for advancement. Supervisor's stated commitment to recommend an individual for advancement based on overall record of performance.

Tasks assigned in rate. A listing of the types of rate specific tasks performed by paygrade.

Advancement examination. Collective performance score on advancement exams for each rate.

Force Structure

Personnel acquisition. Number of recruits acquired for the purpose of enlistment or induction.

Assignment. Number of current sea-based and shore-based billets.

Distribution of personnel. Number of personnel in each paygrade.

Turbulence. Events which interfere with normal planned and scheduled operations, processes, or activities, such as the number of personnel assigned to PCS/TDYs.[1]

Attrition. Number of individuals who separated from the Navy prior to their Expiration of Active Obligated Service (EAOS) date.

Retention. Number of individuals who reenlisted upon completion of their EAOS.

Advancement. Number of personnel eligible for advancement to a higher paygrade.

Training Effectiveness

Curriculum revision. Extent of changes in course content.

Course length. Extent of changes in course length.

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[1]See Glossary for definitions of acronyms.

Course prerequisites. Change in the minimum level of prior training, experience, and/or paygrade required to attend a specific course.

Training attrition. Dissenrollment from/or unsatisfactory completion of a course due to academic deficiency or for nonacademic reasons.

Training backlog. The number of days an individual was in a hold status awaiting enrollment, or having enrolled, is awaiting the convene date of a scheduled course.

Setbacks. The number of academic and nonacademic setbacks an individual incurred in a particular course.

Training interruptions. The total and average number of times an individual was placed in a hold status when instruction was interrupted and the individual was unable to attend after the course convening date.

NECs awarded. Number of Navy Enlisted Classification (NECs) codes which reflect special knowledge and skills that identify personnel and requirements following graduation from an NEC producing course.

Course graduates. Number of individuals who have successfully completed a course of instruction.

Average paygrade. The average paygrade of individuals enrolled in a particular course.

Average number on-board. Number of planned or actual students multiplied by the number of course-instruction days divided by the number of days in a year.

Academic acceleration. The total number of times an individual was reassigned to an earlier class in the same program of instruction.

Standardization of training. Extent to which courses taught at multiple sites (e.g., FCTCPAC and FCTCLANT) match each other.

Career Attitude

Job satisfaction. An individual's perceptions of satisfaction with their job in particular and the Navy in general.

Commitment. An individual's perceptions of commitment to the Navy and expressed intentions to complete their enlistment.

APPENDIX B

VARIABLE SELECTION

VARIABLE SELECTION

To determine which variables would provide the most information and would be the least intrusive and difficult to obtain, each of the variables listed in Appendix A was rated on the scale in Table B-1.Table B-1 lists the factors, definitions, and rating scales used to determine the most appropriate variables.

Table B-1

Factors of Measurement Efficiency

Factor	Definition	Scale
Relevance	The degree to which variable addresses training continuum performance.	0-5
Specificity	Likelihood that variable can be measured reliably and that the data obtained will reflect measurement requirements.	0-5
Cost	The monetary cost of data attainment.	5-0[a]
Attainment difficulty	The problems and complexity of obtaining the data.	5-0[a]
Attainment	The intrusiveness necessitated by the data gathering, primarily into the shipboard environment.	5-0[a]

[a]These factors use reverse scoring; i.e., low cost, low attainment difficulty, low intrusiveness result in a higher score.

Table B-2 lists the ratings that each of the variables attained using the scale in Table B-1.

Table B-2

Variable Efficiency Factor Values

Variable	Relevance	Specificity	Cost	Difficulty	Intrusiveness	Sum
Job Performance						
Supervisor confidence	5	5	4	4	5	23
Skill level	5	5	4	4	5	23
Supervision	5	5	5	4	4	23
PQS progress	5	4	3	3	5	20
Time on task	5	5	4	4	5	23
Recommendation for advancement	5	4	2	3	2	16
Tasks assigned in rate	5	5	2	2	2	16
Advancement exam	5	4	2	3	2	16
Force Structure						
Personnel Acquisition	4	4	5	5	5	23
Assignment	4	5	4	5	5	23
Distribution of personnel	5	4	5	5	5	24
Turbulence	5	4	5	4	5	23
Attrition	4	4	5	5	5	23
Retention	3	3	5	5	5	21
Advancement	3	3	5	5	5	21
Training Effectiveness						
Curriculum revision	4	4	5	5	5	23
Course length	4	4	5	5	5	23
Course prerequisites	4	4	5	5	5	23
Training attrition	4	4	5	5	5	23
Training backlog	5	4	5	5	5	24
Setbacks	4	4	5	5	5	23
Training interruptions	4	4	5	5	5	23
NECs awarded	4	4	5	5	5	23
Course graduates	4	4	5	5	5	23
Average paygrade	4	4	5	5	5	23
Average number on-board	4	4	5	5	5	23
Academic acceleration	3	3	5	5	5	21
Standardization of training	1	1	5	5	5	17
Career Attitudes						
Job satisfaction	5	5	4	5	4	23
Commitment	5	5	4	5	4	23

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