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# THE TIMING OF TRAINING

Kathryn L. Wilson  
Stanley A. Horowitz, *Project Leader*

December 1992

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**INSTITUTE FOR DEFENSE ANALYSES**

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## PREFACE

This paper was prepared by the Institute for Defense Analyses (IDA) for the Assistant Secretary of Defense (Force Management and Personnel), under contract MDA 903 89 C 0003, Task Order T-L7-798, issued 15 March 1990. The objective of the task was to identify promising approaches to maintaining strong military manpower capability during a period of declining budgets and force levels. This is one of a total of seven papers to be published. Each of the seven papers covers a specific area of military manpower management: the proper experience mix, personnel movement, the timing of training, lateral entry, the link between career progression and assumption of management responsibilities, individual training methods, and increased use of simulators for training. The topic of this paper is the timing of training.

This work was reviewed within IDA by Waynard C. Devers and William T. Mayfield of IDA and by Harry J. Gilman, an IDA consultant.

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## I. INTRODUCTION

The typical military recruit receives substantial occupational training. This training may be in the form of formal classroom training, on-the-job training, or a combination. The average recruit spends about 2 months in basic recruit training (boot camp) and between 3 and 12 months in formal training immediately after boot camp.

Skill training may take place during the first or second term of a recruit's military career. The advantages and disadvantages of when skill training is received within the two-term period will be discussed. Delays in training tend to reduce some of the cost of training, but may increase others. They may also affect enlistment, retention, and readiness.

### A. OVERVIEW OF ISSUES

The present climate of reduced force structure and scarce manpower resources necessitates cost-effective training programs. Determining the timing of initial occupational schooling is an important policy decision with implications for recruiting, retention, unit performance, and costs. A general framework for making this decision has never been developed. Our purpose is to identify the elements of such a framework and use them to assist in structuring an evaluation of existing policies on the timing of training.

Every recruit receives basic training, which is a combination of physical training, instruction in basic military skills (such as marksmanship), and an introduction to the culture and procedures of the military. Most recruits also receive formal initial occupational training. Some of the skills learned in this training are general (of use in jobs both inside and outside the military) and some are specific to military jobs. In addition to formal training, recruits receive on-the-job training (OJT), which usually emphasizes specific skills for particular jobs. Skill progression training is also available to first-term personnel, subsequent to initial-skill training. This training is usually given after some work experience, although in some cases, it occurs directly after initial-skill training.

Every year, the services lose personnel who have undergone initial-skill and skill-progression training. If some of this training could be delayed until the end of the first term, the loss due to those who attrit during the first term would be lessened. Attrition

rates in the military services can reach nearly 15 percent in the first year and 40 percent after 3 years (excluding those whose term is up after 3 years).

If some training is delayed until after reenlistment, a portion of the costs of training personnel who do not reenlist are saved. These savings must be compared to the cost of OJT that might be necessary in lieu of formal training. Moving some technical training to the second term (or to later in the first term) allows the OJT instructor to determine if the recruit is a good candidate for more technical training. This "weeding out" process would lower the number of personnel going through more occupational training, thereby saving money. Particularly in units that do not need to be in a high state of readiness, delayed training coupled with OJT may be a cost-effective strategy. However, the cost of the OJT must be compared to the savings from delayed formal training.

The negative effects of delayed initial-skill training include possible decreases in the number of high-quality recruits, reduced job satisfaction leading to fewer reenlistments, delayed promotions, and diminished productivity and readiness. Productivity and readiness can be expected to fall for two reasons: new recruits do not know their jobs well and other personnel get less done because units must provide more OJT. This may lead to increased costs in some areas, such as off-site maintenance. To the extent possible, the total costs of changes in policy must be considered, not just the direct costs. Perhaps most important, first-term training should not be postponed if unit effectiveness is seriously impeded.

One of the primary inducements for entering the military is the promise of training. High-quality recruits may avoid the military without the promise of first-term technical training. There is some evidence that the promise of training in the second term reduces the enlistment of high-quality personnel compared to an early training commitment, but increases it relative to no training commitment (Reference [1]).

Individuals who do not receive formal initial-skill training may be more likely to receive relatively uninteresting assignments in their first terms. This may well make them less likely to reenlist. On the other hand, they will not get assignments that fail to use the training they have received. This is sometimes a source of complaint from those who get early training.

Decreased initial-skill training may reduce the rate of promotion. Certain skill-training requirements are often required for promotion.

If recruits are sent to units after minimal technical training, the units will suffer diminished productivity on the part of senior (and therefore more expensive) personnel

who must spend time instructing the recruits. Other personnel may also be affected by the amount of time senior personnel spend on training recruits. It is possible many skills would be negatively affected by delayed training. A key focus of research in this area should be identifying skills where reduced first-term training would not have unacceptable implications for unit performance.

## **B. ALTERNATIVE APPROACHES TO THE TIMING OF TRAINING**

We will examine three approaches to the timing of initial-skill and skill-progression training, which together we refer to as skill training. In the early training approach, all training takes place immediately after entry into the service, to be followed by a duty assignment. In the mid-term training approach, the recruit receives some initial-skill training, followed by a duty assignment that includes OJT, followed by more initial-skill and skill-progression training. The late training approach places all but minimal initial training in the second term. OJT might replace some initial-skill training.

The second section of this paper discusses the present and past policies on the timing of training by service. The third section considers the impact of decisions concerning the timing of training on enlistment, retention, and unit performance. The *fourth section reviews the costs and benefits of alternative policies regarding the timing of training.* Finally, the summary addresses the additional information that needs to be gathered if we are to assure ourselves that initial-skill training is offered at the most appropriate time.

## **II. POLICY HISTORY**

**This section describes the policies regarding the timing of training within each of the four services over the last two decades. In the services, the timing and amount of skill training have fluctuated over time. Reductions in the amount of up-front classroom training have generally been accompanied by increases in the amount of OJT, and vice versa.**

### **A. ARMY**

**The Army has a two-part sequence of Initial Entry Training for recruits. The first is Basic Training (BT) where the recruit learns general Army skills and philosophies. This training lasts eight weeks [2 and 3].**

**The second is Advanced Individual Training (AIT) where the recruit is trained for a specific Military Occupational Specialty (MOS). The duration of AIT depends on the MOS course content and can vary significantly. The length of the AIT can be from 1 to 9 months, and averages about 3 months [4]. Technical skills, such as electronics, need the longer training. Along with specific skills correlated to the chosen MOS, the soldier continues to receive general Army training.**

**Alternatively, a recruit can attend a combined course of BT and AIT known as One Station Unit Training (OSUT). This approach is used for occupations with a large number of recruits, such as combat specialties. About 34 percent of Army recruits were assigned to OSUT in FY 1991. The first eight weeks of this training parallels the BT training. The recruit must pass this initial training before advancing to the MOS-related training. Again, the length of the MOS-related training depends on the types of skills required by the MOS [3 and 5].**

**Attrition during initial training in the Army runs about 6.3 percent.**

### **B. NAVY**

**The Navy training sequence for enlisted personnel includes initial recruit training, which lasts 8 weeks, and A-school, which is initial-skill training. A-school course work can last from 8 weeks to over 50 weeks, depending on the occupation (rating). The**

average course lasts 53 days [3]. Attrition during initial training was 8 percent in FY 1991. Some occupations allow OJT in place of the A-school training.

In a study done on 18 occupations, Byrnes and Dorsey [6] showed that from FY 1981 through FY 1985, the fraction of individuals who received initial skills through on-board training (OJT) fell from 30 percent to 19 percent. At the same time, the total number of instructional days in A-school increased from an average of 57 in FY 1981 to an average of 63 in FY 1985. Since 1986, the Navy has moved towards more reliance on shipboard training. Formal initial-skill training was reduced for the 18 support-skill ratings. Those ratings with unusually long training pipelines were to reduce the course length by about 25 percent.

About 25 percent of the recruits in the study did not experience true formal training at all. This fraction still pertains today. Instead, those recruits attended a month of apprenticeship training, and then entered fleet duty as general detail personnel. They could train for a rating aboard ship.

### **C. MARINE CORPS**

Marine recruit training currently lasts 11 weeks, not including travel and processing time. The average length of initial-skill courses is 68 days. Attrition during initial-skill training is 4 percent [2].

During the period from 1975 through 1985, the average time spent in recruit training was stable. However, the time spent on general skills (initial-skill training) increased approximately 55 percent [7]. From 1985 to 1986, the time spent on general skills decreased by about 5 percent, reversing the former trend.

Several factors contributed to the increased amount of time spent in general training. The primary explanation was the move away from OJT, requiring an increase in classroom training. This increased the explicit cost of training. Other factors included increases in course lengths and a shift towards more technical occupations. Also, there was a move away from self-paced instruction.

### **D. AIR FORCE**

Recruit training in the Air Force lasts 6 weeks. The average course length in initial-skill training is 50 days, although the variance is large. Packing specialists require 3 weeks of course work while some medical specialists require 52 weeks of initial-skill training. The attrition rate during course work is 5.1 percent. The Air Force sends 97

percent of its enlisted personnel directly to formal training after recruit training. The remaining personnel report to the field.

The Air Force is considering several changes in training policy. One alternative is using civilian schools for some types of initial-skill training. The use of community colleges to teach certain maintenance and mechanical skills would reduce the need for in-house classroom training and lower costs. The recruit would receive the outside training before going to recruit training. Occupations that require skills not specific to the military, such as general mechanic and dental hygienist, are particularly being considered for this program.

Another possible policy change would send recruits through OJT before classroom experience. This would permit feedback from the OJT instructor on the quality of the recruit. It should yield savings by reducing the amount of training given to personnel who leave the service prematurely and the number of Permanent Change of Station moves associated with such personnel.

#### **E. SUMMARY**

The services differ in the lengths of both basic training and initial-skill training (Table 1). The Air Force has the shortest basic training requirement, while the Marine Corps has the longest. The same is true for initial-skill training. The Marine Corps also has the lowest attrition rate while the Navy has the highest.

**Table 1. Summary of Services' Training**

	<u>Army</u>	<u>Navy</u>	<u>Marine Corps</u>	<u>Air Force</u>
Basic Training	8 weeks	8 weeks	11 weeks	6 weeks
Average Initial-Skill Training	63 days	53 days	68 days	50 days
Attrition During Initial Training	6.3%	8.0%	4.0%	5.1%

### III. TIMING OF TRAINING ISSUES

This section focuses on the underlying considerations that should drive decisions about the timing of training. Policy in this area is likely to be affected by recruitment, reenlistment, and productivity issues as well as cost issues. The promise of training, especially training that can be used after leaving the service, is an important recruitment tool. Unfortunately, transferable training may hurt reenlistments. The promise of training in the second term can be used as an inducement to reenlist, this time with both promotion and the promise of salable skills as the incentives. However, delayed training may reduce enlistments of high-quality personnel as well as transfer some training needs to the reserves. Reserve component units are not as able to provide OJT as active units. This has been cited as a factor contributing to readiness problems in reserve units [8]. Determining the extent to which training should rely on OJT is an important factor in analyzing the timing of skill training.

#### A. COST OF TRAINING

In this subsection, we look at the costs associated with training and the way that the timing of training affects those costs. From the perspective of the active service, the longer training is put off, the less costly it is. If training can be delayed until after reenlistment, the service does not lose money by training personnel who leave the military during or immediately after the first term. Training requirements in the reserves may increase, however. Most reserve accessions are individuals leaving the active forces. A significant portion stay in their active component occupations. Reducing the amount of occupational training for first-term active enlistees would increase the training burden on the reserves. Reservists are only available for short time periods, which is not conducive to training. Greater use of computer-based, self-paced instruction may help alleviate this problem.

As Table 2 illustrates, there is substantial attrition from the services during (and immediately following) the first term of service. Attrition that takes place before initial-skill training is not included in the figures.

**Table 2. Cumulative Attrition From the Services (After Basic Training)**

Year	Percentage of Entrants Leaving by End of Year			
	Army	Navy	Marine Corps	Air Force
1	4.8	5.4	5.5	2.0
2	22.0	18.7	14.9	9.0
3	48.8	33.1	25.7	16.3
4	66.4	58.5	71.2	39.5

Source: Defense Manpower Data Center, FY 1989 data.

Table 3 shows cost estimates of training those who later leave the service. These are based on data on the following Individual Training costs from the FY 1991 Military Manpower Training Report:

- Army - \$1,814 million
- Navy - \$1,021 million
- Marine Corps - \$321 million
- Air Force - \$643 million

**Table 3. Costs of Training Those Who Later Leave**

Year	Costs in Millions of 1989 Dollars at End of Year				
	Army	Navy	Marine Corps	Air Force	Total
1	86	55	18	13	172
2	398	191	48	58	695
3	884	338	83	105	1,410
4	1,205	597	229	254	2,284

Sources: "Military Manpower Training Report FY 1991," October 1990 update; Defense Training and Performance Data Center; Defense Manpower Data Center.

The entries in the table were derived by multiplying the total cost of initial-skill training by the attrition percentages in Table 2. Nearly \$2.3 billion in training costs is incurred by those who do not later reenlist. These figures do not include the pay and allowances of trainees, since they would be borne with or without training. The costs of OJT are not reflected in these figures.

Quester and Marcus [9] showed that in the Navy, OJT costs less than initial-skill training. In their study, a Mess Management Specialist was shown to cost \$60 thousand in 1989 dollars over a 4-year term if trained in school. A person in the same specialty who learned the job via OJT only cost \$56 thousand. For this non-technical skill, the savings

were not great. However, for an Electronics Technician, the cost with school was \$79 thousand and the OJT cost was \$56 thousand.

There are several caveats to the possible savings. The Quester and Marcus study include only the recruit's pay as the cost of OJT. In reality, other costs are associated with OJT, such as reduced productivity of the trainer and reduced readiness of the unit. Also, the lower level of training attained by the OJT-trained recruit in the first term may need to be enhanced in the second term. In replacing formal initial-skill training with OJT, training costs are probably replaced to some extent by higher operational costs. Training costs in the reserves also increase.

John Buckley from the Army Training and Doctrine Command (TRADOC) presents some innovative alternatives to the present training policy [5]. His thesis, like ours, is that much of the training budget is needlessly wasted due to attrition. For example, 5,022 personnel trained for the Light Wheeled Vehicle Mechanics MOS in 1988. Of this total, only 16 percent reenlisted in the same MOS. About 30 percent reenlisted into another MOS requiring additional training and 54 percent left the service. Buckley's analysis saw similar patterns in 20 other MOSs.

Several alternative training methods were suggested, depending on the technology level and the amount of military content (Figure 1). Level 1 training could be shifted to the civilian sector. The Light Wheeled Vehicle Mechanic falls into this category, and a TRADOC analysis shows that 98 percent of the necessary training could be taught outside the service.

Level 2 training could also be transferred to the civilian sector. This transition might require direct connections with vocational training centers to ensure consistency and depth of training.

Both of the categories high in military training are recommended to have in-service training. In order to reduce wasted training funds, recruits would move into level 3 MOS after Basic Training rather than level 4. Level 3 training would be OJT, thereby eliminating the need for duplicative equipment in the classroom. Level 4 MOS training would occur only in the second term, and could be used as a reenlistment incentive.

Substantial savings can be obtained by delaying training, although some of the savings are offset by lower productivity on the part of personnel. These productivity effects are addressed in the next subsection. Then, we will go beyond the direct effects of delaying training to consider its secondary impacts on recruitment and retention.

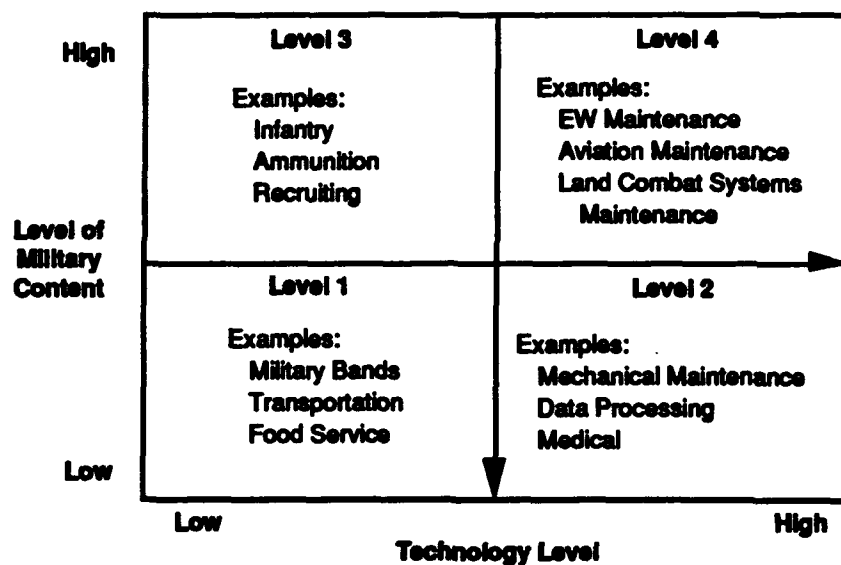


Figure 1. Career Clusters

## B. PRODUCTIVITY ISSUES

Even if personnel are not formally trained, they still contribute to the services, although with lower productivity. Table 4 shows representative estimates of the net productivity (relative to the average specialist with 4 years of experience) of personnel who attend initial-skill training and those that go immediately to direct duty [9]. For example, the productivity of an electronics technician with 2 years of experience and school-training would be 72 percent of the average 4-year specialist. The net productivity is the individual's production less the lost production of supervisors and instructors. The negative number for the first month indicates the cost to the unit for training personnel on the job. Over time direct duty personnel increase their contribution to the unit, but over the entire first term they contribute markedly less to unit performance than do school attendees.<sup>1</sup>

The information in Table 4 is based on a survey done in the late 1970s [6 and 9]. It is possible that the productivity of units with additional OJT trainees is (or could be) higher today. The availability of instructional media such as interactive videodisc and other distributable training technologies should allow skills to be picked up faster on the job and should ease the burden of OJT on senior personnel.

<sup>1</sup> It is interesting to note that supervisors supplying the data did not think that their own personnel on average reached the level of the average specialist.

**Table 4. Net Productivity Rates in the Navy**

	Low-Tech Jobs (Mess Management Specialist)		High-Tech Jobs (Electronics Technician)	
	School	Direct Duty	School	Direct Duty
	After 1 month	0.02	-0.16	-0.20
After 1 year	0.44	0.29	0.41	0.13
After 2 years	0.71	0.59	0.72	0.47
After 4 years	0.95	0.90	0.98	0.78

It is worth noting that the productivity of direct duty personnel is the result of a substantial amount of OJT. This suggests that a strategy of delaying formal training into the second term would allow the amount of material taught in formal schools to be cut considerably. The people who are still around to receive training will not need as much because they will have picked up many of the necessary skills on the job. Of course, OJT itself is a training cost.

The most productive mix of classroom training and OJT depends on the skills to be acquired and the resources available for formal-skill training. These two types of training are substitutable to an extent for many skills. A mix of both types of training could allow introductory classroom material to be reinforced by OJT. Promising candidates could be recommended for additional training, perhaps in the second term, as a reenlistment inducement and a cost saver. There is little quantitative information available on the desirability of using OJT as a filter for promising students. The Air Force has indicated some interest in this approach.

The Quester and Marcus study [9] concluded that attempting to replace formal schooling with only OJT would save money, but is also comparatively inefficient. By developing an effectiveness index that took into account the relative productivities of personnel who went through the two pipelines, Quester and Marcus determined that formal schooling is more cost-effective for most occupations. For two occupations, Radiomen and Machinist's Mates, OJT appeared to be slightly more cost-effective. The cost-effectiveness conclusions rest on the assumption that it is desirable to maximize output per dollar. In a low-threat, peacetime environment both less output (lower readiness) and less output per dollar of training expenditure might be acceptable in order to save money. In such a circumstance, substituting OJT for early formal training may be a good buy.

## **C. RECRUITMENT ISSUES**

In-service training is believed to be an important recruiting tool. Service advertising campaigns emphasize the training opportunities available. Training as a recruiting incentive is particularly aimed at above-average recruits without other means to receive technical training. It is often restricted to particular skill categories.

Generally, promises of training refer to formal classroom training. If the services move in the direction of more OJT, promises of OJT might well elicit a similar response. The marketability in the outside world could be similar, though its visibility is lower.

Service-provided training is not the only non-pay incentive used to attract recruits. The post-service educational benefits (the GI Bill before 1977, the Veterans Educational Assistance Program (VEAP) after that, and the Montgomery G.I. Bill since 1985) are perhaps the best-known enlistment incentives. Reduced length of first-term enlistments and enlistment bonuses are used to attract highly qualified recruits. Many of the inducements have strings attached, such as specific skill areas or specific duty tours.

In 1979, the Multiple Option Recruiting Experiment (MORE) tested various enlistment incentives (known as "kickers") by geographic area for Army, Navy, and Marine recruitment. Depending on the service, these included guaranteed in-service training, a 2-year enlistment option, increased post-service educational benefits, and an option to enter the reserves after initial training instead of active duty. The purpose of the test was to attract high-quality recruits into specific skill areas.

Haggstrom and his colleagues [1] found that, in terms of discovering useful recruitment techniques, the results of the test were disappointing. The 2-year enlistment option did not show a significant increase in high-quality recruits in the Army, which comprised the largest sample. Positive, though imprecisely measured, results occurred in the smaller samples of the Navy and Marine Corps where the option was available for all skill areas. The drain on 3- and 4-year commitments seems to make 2-year enlistments an unattractive and costly option from the services' point of view. The educational kickers also did not appear to induce increased recruitment of high-quality personnel, and considering the negative reenlistment incentive attached to the kicker, might prove costly to the services. This last result is surprising in that other evidence has shown post-service educational benefits to be an effective recruiting tool.

Although Haggstrom et al. did not view the MORE test results as meaningful, some interesting implications can be drawn from the Navy data. The Navy test included an option for immediate guaranteed A-school training, and two options for guaranteed A-

school training after reenlistment. Unfortunately, these options were combined with other enlistment incentives. The options are listed in Table 5.

**Table 5. Navy Test Options**

	A-School Training		
	Immediate	Reenlistment	None
2-year option with VEAP kicker	Area A	Area B	
2-year option with no kicker		Area C	Area D
VEAP kicker <sup>a</sup> with normal enlistment			Area F
Control Group (no incentives)			Area E

<sup>a</sup> Kicker is \$4,000 instead of \$2,000, as in other options.

By examining geographic Areas A, B, C, and D as a group, we were able to isolate the effects of the early and late training on recruitment. Apparently, just the promise of training at any time has some effect on the number of high-quality recruits. These effects were very small, although the promise of immediate training was slightly more attractive than later training. We estimate that in 1978, the promise of immediate training would have added only about 300 high-quality recruits to a pool of 23,000. This estimate is imprecise. In order to produce more definitive results, a larger and more complete data set is needed. Unfortunately, no such data are available.

#### **D. REENLISTMENT ISSUES**

Depending on the circumstance, training delayed until after reenlistment can be either an incentive or a disincentive to reenlist. If the first term has been a positive experience, the promise of training after reenlistment may be the stimulus needed to encourage reenlistment. However, if the first term has not been a positive experience, training in the second term may make no difference. If the lack of training in the first term is often the cause of a negative experience (by, for example, assigning enlistees to uninteresting jobs), delaying training is likely to harm retention.

If initial-skill training is delayed until the second term, some training in the first term will have to occur through OJT. This hands-on experience may be more interesting to some personnel than classroom work; however, others may prefer formal study before field experience.

A factor that bears centrally on the relationship between the timing of training and reenlistment decisions is the value of military training in the civilian world. If the formal training received within the military is easily transferable to the civilian sector, personnel

may be less likely to reenlist once they receive training. Of course, if skills learned through OJT are equally transferable, the timing of formal training may not have much of an effect on reenlistment.

The difference between the civilian pay available to those in a particular military occupation and their military pay can be thought of as a proxy for the value of military training. The extent to which this difference is higher in more technical occupations and retention is lower gives an indication of the role of early training in influencing retention behavior. Typically, technical occupations have relatively low retention rates. This was demonstrated by Goldberg [10]. To some extent, this correlation may be due to the high intrinsic intelligence and marketability of personnel assigned to these occupations, but it is probably also due to the fact that valuable training is received early in the military careers of technical personnel.

The relationship between the timing of training and retention is an empirical issue. One can conceive of untrained personnel being placed in boring jobs and losing all enthusiasm for the military. This would make them very unlikely to reenlist even if they were promised training. On the other hand, the promise of later training could be a strong inducement to stay in, and the early delivery of marketable training, a strong inducement to leave after the training is received. We know of no quantitative analyses of how delaying training actually influences retention.

## **IV. TIMING OF TRAINING OPTIONS: PROS AND CONS**

Thus far, we have examined the kinds of effects that alternative choices concerning the timing of training would have on the services in a general way. The points have been illustrated quantitatively where possible, but there has not been a systematic comparison of options. The natural next step would be to structure and perform a cost-benefit analysis to examine how the pros and cons of alternative policies balance out. Unfortunately, we do not have enough information about the magnitude of the relevant effects to carry this out.

In this section, we take a step toward structuring the analysis. The pros and cons associated with each of the three training approaches introduced in Section I—all initial-skill training early in the first term, initial-skill training before reenlistment, and some initial-skill training after reenlistment—will be discussed, but they will not be quantified. The purpose of this exercise is to identify what needs to be learned to support policy making regarding the timing of training.

### **A. SKILL TRAINING EARLY**

Early skill training is most likely to appeal to the recruit. Under this scenario, recruits receive training directly after basic training. After skill training, recruits report to their first duty station. At this point, some OJT will be provided; however, it is assumed that of the three scenarios, early training requires the least OJT.

The advertising campaigns of the services rely on technical training as a method of attracting capable personnel. The benefits of early training are listed below.

- The assurance of immediate training provides an incentive to join the military. This option maximizes recruit perceptions about the expected amount of marketable human capital they will receive. It should attract more high-quality personnel.
- Recruits are less likely to get assigned to boring, menial tasks because they will have more capability to tackle advanced tasks.
- Training does not have to be tailored on an individual basis to fit in with the schedules of field activities.
- Unit readiness should be higher for two reasons. First, new personnel will be more productive because of their formal schooling. In addition, supervisory

personnel will not be diverted from their primary tasks to provide OJT as much as under other options.

- Retention may be increased. If recruits have a positive experience, they may feel their chances for promotion and good assignments are increased.
- Reserves receive adequately trained personnel.
- Personnel are able to acquire the training necessary for promotion.

The out-of-pocket costs of training to the services are highest with early training.

The negative aspects are listed in the following points.

- Substantial attrition takes places throughout the first term. Attrition of 11 percent during the first year grows to 62 percent by the end of the first term. Training costs are incurred before it is known whether or not the recruit will reenlist. As a result, more personnel must be trained in order to have the needed number of trained careerists. The formal training establishment must be larger.
- Training is received before the technical potential of the recruit is known through OJT. As a result, inappropriate training may take place.
- Spending more time providing OJT might be an appropriate task for some units. These are units that would probably not be expected to maintain a high level of readiness.
- Training knowledge may be lost through lack of application. Personnel may become bored because they do not get to use the skills they have been taught.
- Giving recruits marketable skills is likely to make them less inclined to reenlist.

## **B. SKILL TRAINING BEFORE REENLISTMENT**

The middle option allows for completing initial-skill training before the end of the first term. It allows for some OJT between preliminary initial-skill training and additional initial-skill training. This method may be the optimal training strategy from the learning point of view. A careful mix of formal training and OJT may enhance a recruit's learning retention. However, costs and other factors must be considered.

This middle option may not be as attractive to the recruit as the early training option; however, receiving training towards the end of the first term allows the term to end on an up beat. The benefits of this option are as follows.

- Training in the first term is an incentive to join.
- Less formal training may be needed as a result of OJT.

- Much premature attrition will occur before the later training; therefore, fewer recruits will have to be trained.
- Recruits receive training shortly before their decisions to leave or stay. Recruits may get a feel for the probability of promotion and future assignments. The future may look rosier during training.
- By providing some OJT before formal training, units are able to provide feedback as to which recruits should receive advanced training. A larger fraction of trainees should successfully complete training. Therefore, fewer formal trainers should be needed. Recruits are more likely to receive training that is appropriate to their interests and abilities. Thus, productivity should be higher.

The services will save money in schools under this scenario relative to the early training scenario. However, there will be increased costs in unit training and may be negative effects on both enlistment and retention. Also, there is some burden of undertrained recruits on operational units. To summarize, delayed training has the following negative features.

- The need to provide more OJT will reduce unit readiness. Training costs in the units will increase.
- Again, training costs are incurred before it is known whether or not the recruit will reenlist. Some of the investment in training will be wasted, even more so than in the case of early training. There is a shorter payback period before the decision to get out is made.
- Delayed training in the first term may not provide as strong a recruiting incentive as immediate training. This has never been examined quantitatively.
- As is true of the early training option, training before reenlistment will enhance a person's market value, making retention less likely.
- Determining how best to integrate formal training and OJT will be expensive and difficult. In some cases additional Permanent Change of Station moves may be required.
- Promotions may be delayed unless promotion policy is changed.

### **C. SOME INITIAL-SKILL TRAINING AFTER REENLISTMENT**

Delaying some initial-skill training until after reenlistment saves the cost of training those who will leave the military. The effect on initial enlistments will increase recruiting costs, and first-term pay might have to be increased to balance the reduced value of first-term training.

The benefits of delayed training are listed below.

- Formal training costs would be lower because fewer persons would be trained.
- Reenlistments would probably rise. Civilian alternatives look less attractive to those with less training.
- Less formal training would be needed because of the amount of OJT received in the first term.
- The OJT experience should allow the OJT trainers to identify the most suitable candidates for further training.
- The OJT experience should allow individuals to better identify what areas they want to be trained in.
- For units that do not need to be in a high state of readiness, providing more OJT may be an efficient way of employing trained personnel.
- Some recruits may prefer hands-on learning instead of classroom training. These recruits may be happy to put off formal training, or dispense with it entirely.

There would, however, be some hard-to-quantify costs associated with delaying formal training into the second term. These are listed below.

- Individuals who want training within the first term would not enlist. Although some would have left at the end of the first term, others would have stayed in.
- Retention might decrease due to unfulfilled expectations and boredom from menial tasks, as well as frustration from not understanding the technical aspects of an operational unit.
- Reliance on OJT would be heavy, which raises OJT costs and may demoralize OJT trainers. OJT costs to the unit include lowered productivity of the OJT trainers, other operational personnel who need the trainers' inputs to perform their duties, and the recruits who have little previous training. Readiness will be lower. The retention of senior personnel may be adversely affected.
- Retention of second-termers would fall. Individuals who were induced to reenlist in order to get formal training would be less likely to remain in the service once their commitments expired.
- Some cost of training may be shifted to the reserves.
- Promotions may be delayed unless promotion policy is changed.

## **D. REQUIREMENTS FOR ANALYTIC POLICY MAKING**

In order to turn this list of pros and cons into a quantitative policy analysis, better information is needed. This information falls into three categories:

- *Information on how people would react to changes in their incentives*—This includes the effect of delaying training on enlistment and retention. While some information is available on recruiting effects, it is very sketchy. No analysis has been done on retention effects.
- *Information on how delaying training would affect the readiness of units*—The fact that units would be getting less productive people and that trained personnel would have to provide OJT to them would both have an effect.
- *Information on the potential cost savings of adopting alternative training strategies*—It is fairly simple to calculate savings due to giving individuals a chance to leave before training them. It is more difficult to determine how much formal training can be cut back because of the provision of OJT. It may cost more to utilize OJT than stay with the present system of formal training.

Much of the necessary information would be difficult to generate. Surveys and experiments would probably be needed. Appropriate policies regarding the timing of training are likely to differ by occupation. Early training will make more sense, for example, in low-training-cost occupations. Data generation and analysis must proceed at the occupational level. Before embarking on these kinds of endeavors, however, it should probably be determined whether the resulting analyses are likely to indicate the cost-effectiveness of making major changes in the timing of training.

## V. SUMMARY AND RECOMMENDATIONS

### A. SUMMARY

The services at the present time usually send recruits to initial-skill training directly after recruit training. This is costly. Over two billion dollars per year are spent training recruits who leave during or immediately after the first term. Assuring the cost-effectiveness of policies concerning the timing of initial-skill training could make a significant contribution to the efficient operation of a ready force.

We have described the costs and benefits of alternative approaches to the timing of training. Early training is attractive for recruiting, but has high direct costs. It also discourages reenlistment. Training at the end of the first term would entail lower direct costs, since it would take advantage of early attrition to reduce the number of trainees. However, it would still probably discourage reenlistment. Training delayed until after the first term would most likely increase retention and is the least costly option. It would have a negative impact on enlistment, however. Furthermore, the costs of additional OJT would at least partially offset the monetary savings from delaying training. These costs would manifest themselves in the lower readiness of units that have a heavier burden of providing OJT.

It is not now possible to quantitatively balance these various effects against each other to determine the proper policy concerning the timing of training. There just is not enough information. In particular, key information is missing regarding the following relationships:

- The effect of delayed training on recruiting and the extent to which OJT and formal training differ as recruiting incentives.
- The effect of delayed training on retention. We have hypothesized effects in both directions. On balance, delayed training seems likely to improve retention, but we do not know how much. Of course, to the extent that OJT is substituted for early formal training, the marketability of individuals who leave at the end of their first terms may remain high, and delaying (or eliminating) formal training might have no effect on retention.
- The extent to which OJT early in the first term reduces the necessary amount of formal classroom training.

- The implications of providing less initial training for unit readiness.
- The costs of OJT. All the data we have seen on this subject date from the 1970s. More recent information would be useful, particularly information that considers the potential use of automated training delivery technology for reducing the burden on supervisors.

## **B . RECOMMENDATIONS**

Since many of the critical parameters that determine what policy regarding the timing of training should be are unknown, sweeping policy recommendations are not appropriate. This is not, however, a justification for inaction. A three-pronged approach should be considered.

First, perform a sensitivity analysis to better understand the extent to which policy determination depends on developing better information. Toward this end, a quantitative simulation model should be built that identifies the cost and readiness effects associated with alternative timing-of-training policies for a range of plausible assumptions. One benefit of this exercise would be to determine whether some aspects of the right policy are independent of the exact numbers. The model should focus on four key elements: formal training costs, recruiting costs, retention costs, and the effects of various levels of OJT on the cost of formal training and on the units providing OJT. Two approaches to addressing the effect of OJT on units should be examined. One approach would be to "cost" OJT according to the pay of supervisors who are diverted from other activities. The other would be to treat the decreased productivity of unit personnel due to the need to provide OJT as equivalent to having fewer people. The effect of having fewer people on personnel "readiness" as reported by the SORTS (Status of Resources and Training System) readiness-reporting system could be estimated.

Second, the services should be encouraged to perform analyses to better understand the implications of variations in current training policy. For example, identify cases where people in the same occupation receive different amounts of initial training and examine how much these differences are associated with retention and job performance.

Finally, we should pursue research that draws on current experience with OJT to fill in some of the gaps in our understanding that have been identified.

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**ABBREVIATIONS**

## **ABBREVIATIONS**

<b>AIT</b>	<b>Advanced Individual Training</b>
<b>BT</b>	<b>Basic Training</b>
<b>IDA</b>	<b>Institute for Defense Analyses</b>
<b>MORE</b>	<b>Multiple Option Recruiting Experiment</b>
<b>MOS</b>	<b>Military Occupational Specialty</b>
<b>OJT</b>	<b>on-the-job training</b>
<b>OSUT</b>	<b>One Station Unit Training</b>
<b>TRADOC</b>	<b>Training and Doctrine Command</b>
<b>VEAP</b>	<b>Veterans Educational Assistance Program</b>