DOCUMENT RESUME

ED 289 021 CE 049 174

AUTHOR Anderson, Clinton L.
TITLE Educating the United States Army.
PUB DATE 23 Oct 87
NOTE 42p.; Paper presented at the Annual Meeting of the American Association for Adult and Continuing Education (Washington, DC, October 23, 1987).
PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Adult Education; *College Programs; *Continuing Education; Educational Needs; *Educational Trends; Extension Education; Futures (of Society); Job Training; *Military Personnel; *Military Training; Postsecondary Education; Student Characteristics
IDENTIFIERS *Army

ABSTRACT

The United State Army has an education/training strategy that provides the conceptual framework for planning, programming, budgeting, and conducting and/or overseeing all education and training necessary to accomplish its military needs and to care for the human needs of soldiers and their family members. This strategy includes education and training for deployed, contingency, and reenforcing forces; training and education support programs to sustain individual and collective job performance; voluntary self-development for soldiers and adult family members; and schools for Army dependents. This paper reviews the entire spectrum of education and training in the Army and then concentrates on the general education element as adult and continuing education within the U.S. Army. The paper also contains a discussion of challenges and issues facing the broad spectrum of Army education and concludes with some expected trends and developments in education and training as the Army approaches the next century. Statistics on how many and what types of personnel are enrolled in various types of educational programs are included in this report. A 48-item bibliography is also included. (KC)

EDUCATING THE UNITED STATES ARMY

Clinton L. Anderson*

* The views expressed in this paper are those of the author and do not nessarily reflect the position or policy of the United States Department of Defense or Department of the Army.

The United States Army has the constant mission of maintaining that nation's ability to use land components of the United States military power throughout the world in coordination with other military services and allied forces and in consonance with national goals and interests. In order to accomplish this mission, Army education and training encompasses the Active Component (i.e., deployed and continental U.S.-based (CONUS) active forces), the Reserve Component (i.e., the National Guard, the Selective Reserve Units, the Mobilization Designees (MOBDES), and the Individual Ready Reserve (IRR)), and the Civilian Component (e.g., civilians employed by the Department of the Army and Department of Defense, defense contractors, etc.).

Initial entry trainees are voluntary soldiers. Enlisted recruits are 17 years of age or older and are on the threshold of adulthood. Most have completed at least 12 years of civilian education and enter the Army with a variety of expectations and goals. Pre-active duty education for officers can occur at the United States Military Academy, West Point, New York, or at numerous colleges and universities that participate in the Reserve Officer Training Corps (ROTC) Program. Opportunity for students to gain some Army orientation can take place in secondary schools which sponsor Junior ROTC units.

The Army has an education/training strategy which provides the conceptual framework for planning, programming, budgeting, and conducting and/or overseeing all education and training necessary to accomplish its military and to care for human needs of soldiers and their family members. This strategy includes education and training for deployed, contingency, and reenforcing forces; the peacetime and mobilization training bases; training and education support programs to sustain individual and collective job performance; voluntary self-development programs for soldiers and adult family members; and dependent schools for children of active duty soldiers as needed. Implementation of this education/training strategy and long-range military plans provide a coherent process that helps insure a smooth and timely integration of manpower, materiel, doctrine, technology, and other resources to produce a well-trained, modern, mission-capable fighting force.

Although this chapter combines education and training under the umbrella of "educating the Army", these terms frequently cause confusion and misunderstanding. Masland and

Radway (1957:50-51) have provided an insightful differentation between the two terms:

> In the narrower, more precise sense--training identifies instruction that is oriented to a particular military specialty and that is designed to develop a technical skill. It also includes tactical training of land, sea, and air units. Training thus may be given directly to the individual or to organized units and larger groups. Education, on the other hand, implies instruction or individual study for the purpose of intellectual development and the cultivation of wisdom and judgment. It prepares a man to deal with novel situations. It is usually provided in schools and is provided without regard to the student's job assignment in a particular unit. Whereas training is job-oriented, education goes far beyond the next assignment and seeks to prepare the (commissioned, warrant and non-commissioned) officer for a lifetime career of service involving ultimately the distinction between training and education. The whole learning process might be thought of as a spectrum, with 'pure training" (such as a simple exercise in assembling a rifle) at one end, and with 'pure education' (involving the highest level of abstraction) on the other.

Army leaders such as General George E. Blanchard when serving as Commander-in-Chief, United Army, Europe, between 1974 and 1977 propagated the idea that "education is training and training is education". Blanchard (Department of the Army 1976:6) stated unequivocally: "Most of you know my philosophy on education and training-- it's all one thing." Historically, however, Army literature has differentiated among "military education", "general education" or "Army continuing education" and "military training". The distinction between military and general education has been that military education is "the systematic instruction of individuals in subjects which will enhance their knowledge of the science and the art of war", (Department of the Army 1974:1,2), while general education is "aimed at a proper use of formal civilian educational opportunities in combination with military training and military education to challenge the individual to develop to his greatest potential" (Department of the Army 1970:5).

This chapter will review, first, the entire spectrum of education and training, and then concentrate on the general education element as adult and continuing education within the U.S.Army. The latter part of the chapter will contain a discussion of challenges and issues facing the broad spectrum of Army education and conclude with some expected trends and developments in education and training as the Army approaches the 21st Century.

GOALS

The U.S.Army has set series of goals for itself and its personnel. The training and education goal is usually stated somewhat like this: "To develop and sustain a combat-ready force prepared to mobilize, deploy on short notice, fight, and defeat enemies of the United States in support of worldwide national commitments according to the Joint Strategic Plan (JSCP) as directed by the National Command Authority" (Anderson 1984). The Chief of Staff, U.S.Army, in his White Paper 1980 declared that "fully trained individuals and fully trained units are a corporate responsibility" (Department of the Army 1980:11). He reiterated the common Army tradition that commanders at all levels must give "priorty effort" to training with focus on "total preparation of each Army unit to go to war-- and win."(p11)

The Army, in conjunction with the Air Force, has developed a new fighting doctrine called "AirLand Battle 2000"(Schultz 1983). The Army has further elaborated on this doctrine in documents entitled "Army 21"(e.g., Department of the Army 1985a). These "how to fight" instructions call for a quantum increase in required individual skills and knowledge. This doctrine envisions an extended and integrated battlefield that may require the soldier to fight anywhere, at any time, against conventional, unconventional chemical, biological, nuclear and electronic threats, in all types of terrain, in all kinds of weather and visibility for extended periods of time. Resources will be widely scattered and soldiers must be capable of operating as effective team members with various mixes of United States forces and Allied forces. General J.A.Wickham, the Army's current Chief of Staff, summarized these doctrinal changes as follows:

> An evolution in doctrine and tactics now places unprecedented emphasis on initiative, offensive action, flexibility, and coordination within the combined arms team. New tactical concepts require excellence in professionalism and military skills by leaders at all levels (Wickham 1984:7).

Emerging new systems require the individual service member to operate on the battlefield in automated, semi-automated and manual modes as the situation demands. As a result, soldiers need many new system-related skills and knowledge. But some Army planners seem to foresee a fundamental educational problem in the manpower supply of the United States that may hinder implementing this new doctrine:

> The Army 21 soldier must be tactically and technically proficient. Almost all soldiers will possess high school level training, but the quality of basic skills education may be in question" (Department of the Army 1985a:6-6).

Meanwhile, the Army must consider the "human goal" (Department of the Army 1982b). Military leaders would like to see their forces composed of military and civilian professionals who loyally serve their nation in rewarding careers. In order to achieve this end, the Army attempts to provide all soldiers with meaningful and satisfying duty, adequate living and working facilities, equitable compensation, professional development, and advancement opportunities. The Army training and education strategy must incorporate both personal development and military training goals in order to have able and willing personnel who can use and maintain high technology equipment and can fight in modern warfare.

CATEGORIES OF EDUCATION AND TRAINING

When considering the full spectrum of education and training in the Army, a minimum of five categories need be cited (figure 1). First, there is preparation for entry into and /or employment in the Army. Examples from this category are academic and vocational education and training. Physical, mental, and moral fitness, and willingness to serve are emphasized in this category. Pre-enlistment activities extend into the nation's secondary school system, post-secondary educational institutions, civilian adult education centers, and job training programs sponsored through the Department of Labor and state, local and private organizations. Perhaps the best known formal education/training programs in this category are the Junior and Senior Reserve Officer Training Corps (ROTC) efforts in high schools and colleges and universities throughout the United States. Lieutenant General DeWitt C.Smith, twice Commandant of the Army War College, observed:

> Educators, quite naturally, think of ROTC cadets as scholars; the Army, equally naturally, thinks of them as prospective officers. These two views are not mutually exclusive. Indeed, we will need educated leaders in our armed forces for as long as we need armed forces in this dangerous and imperfect world. As we all regrettably have observed, war is one of the constants of history, and we cannot dispose yet of soldiers and armies. Our young soldiers therefore must be led, and our nation's leaders advised, by officers of intellect, character, and high competence. Educators and ROTC leaders together bear the responsibility for beginning the development of these uniformed men and women (Smith 1985:11).

For the purpose of this discussion, cadets in the United States Military Academy (USMA) are also included in this category. USMA, being integral to the active Army, has a dual mission with ROTC units to prepare prospective officers

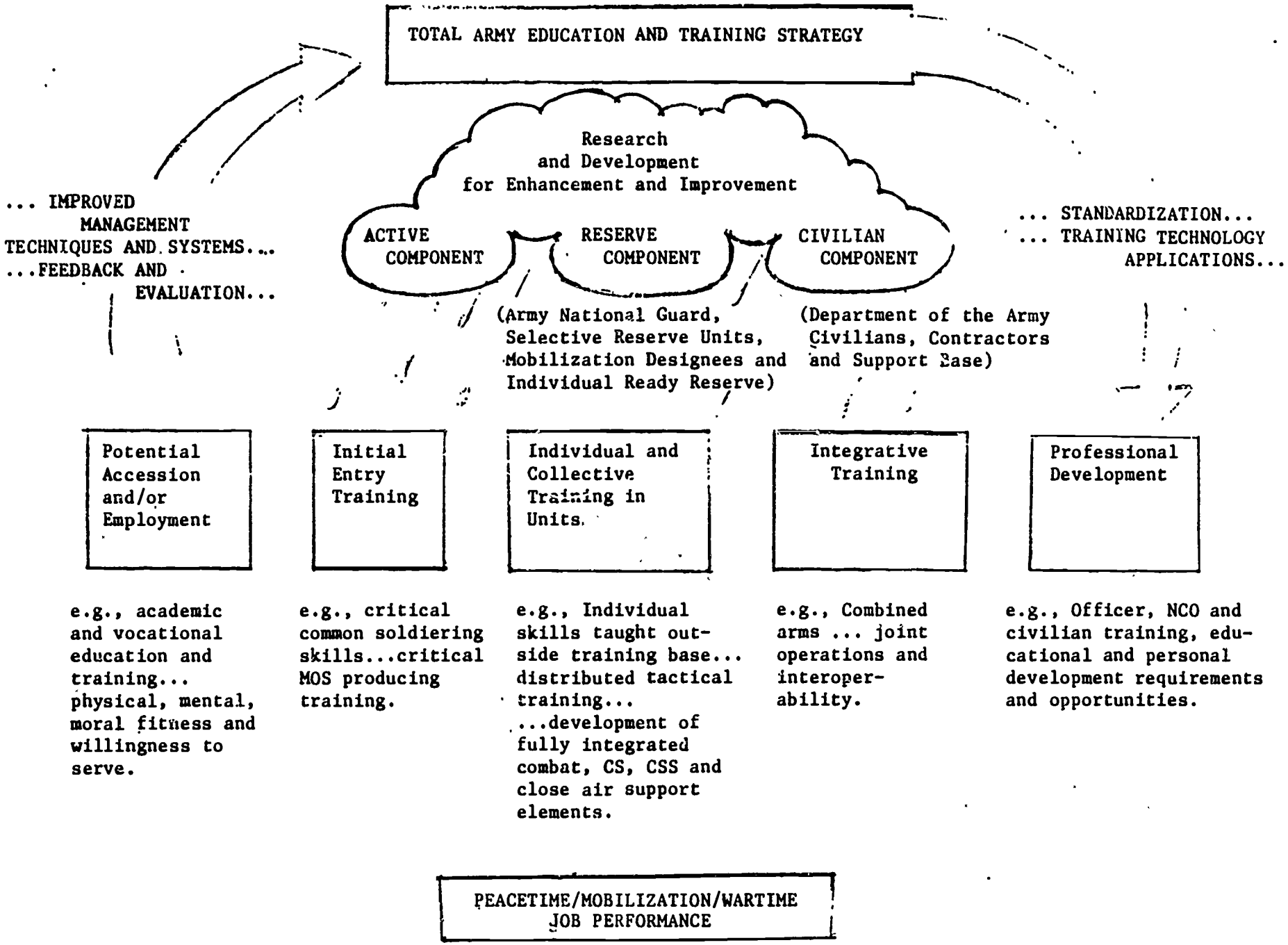

TOTAL ARMY EDUCATION AND TRAINING STRATEGY
Research
and Development
for Enhancement and Improvement
... IMPROVED
MANAGEMENT
TECHNIQUES AND SYSTEMS...
...FEEDBACK AND
EVALUATION...
ACTIVE
COMPONENT
RESERVE
COMPONENT
CIVILIAN
COMPONENT
... STANDARDIZATION...
... TRAINING TECHNOLOGY
APPLICATIONS...
(Army National Guard, Selective Reserve Units, Mobilization Designees and Individual Ready Reserve)
(Department of the Army Civilians, Contractors and Support Base)
Potential Accession and/or Employment
Initial Entry Training
Individual and Collective Training in Units
Integrative Training
Professional Development
e.g., academic and vocational education and training... physical, mental, moral fitness and willingness to serve.
e.g., critical common soldiering skills...critical MOS producing training.
e.g., Individual skills taught outside training base... distributed tactical training... ...development of fully integrated combat, CS, CSS and close air support elements.
e.g., Combined arms ... joint operations and interoperability.
e.g., Officer, NCO and civilian training, educational and personal development requirements and opportunities.
PEACETIME/MOBILIZATION/WARTIME
JOB PERFORMANCE

FIGURE 1

in an "educational environment." The long and honored traditions of USMA and its Corps seem to make it a national heritage that ROTC even that associated with state military colleges, such as Virginia Military Institute and the Citadel, The Military College of South Carolina, cannot or will not replace.

Second, is initial entry training. During the first 13 weeks or more, enlisted recruits learn common military skills and undergo critical specialty training. Successful completion of this phase of training occurs when soldiers are awarded particular specialty certifications (e.g., military occupational specialty (MOS), additional identifiers,etc.), and sent to their first permanent duty station. For example, the Army Basic Training (BT) and Advanced Individual Training (AIT) or a combination of the two called One-Station-Unit Training (OSUT) are specific programs in this category. Incoming officers (even those graduates from USMA) generally undergo a basic course in a particular branch or specialty before going to a first permanent assignment. Many civilian come into Army employment through initial intern programs. These initial entry activities provide for a transformation for the person who is coming from the civilian sector into Army employment. This initial period of training seems to have considerable influence throughout a person's Army career.

Third, is individual and collective training in units. This category includes individual skills training outside the formal training base (i.e.,formal schools and training centers where initial entry or basic courses are conducted). It also includes distributive tactical training or unit training essential for the development of fully integrated combat, combat support (CS), combat service support (CSS) and close air/land support elements.

Fourth, is integrative training. This includes intra-service combined exercises, joint operations among United States military units (Army, Air Force, Navy and Marine Corps), and interoperability exercises between United States units and Allied forces.

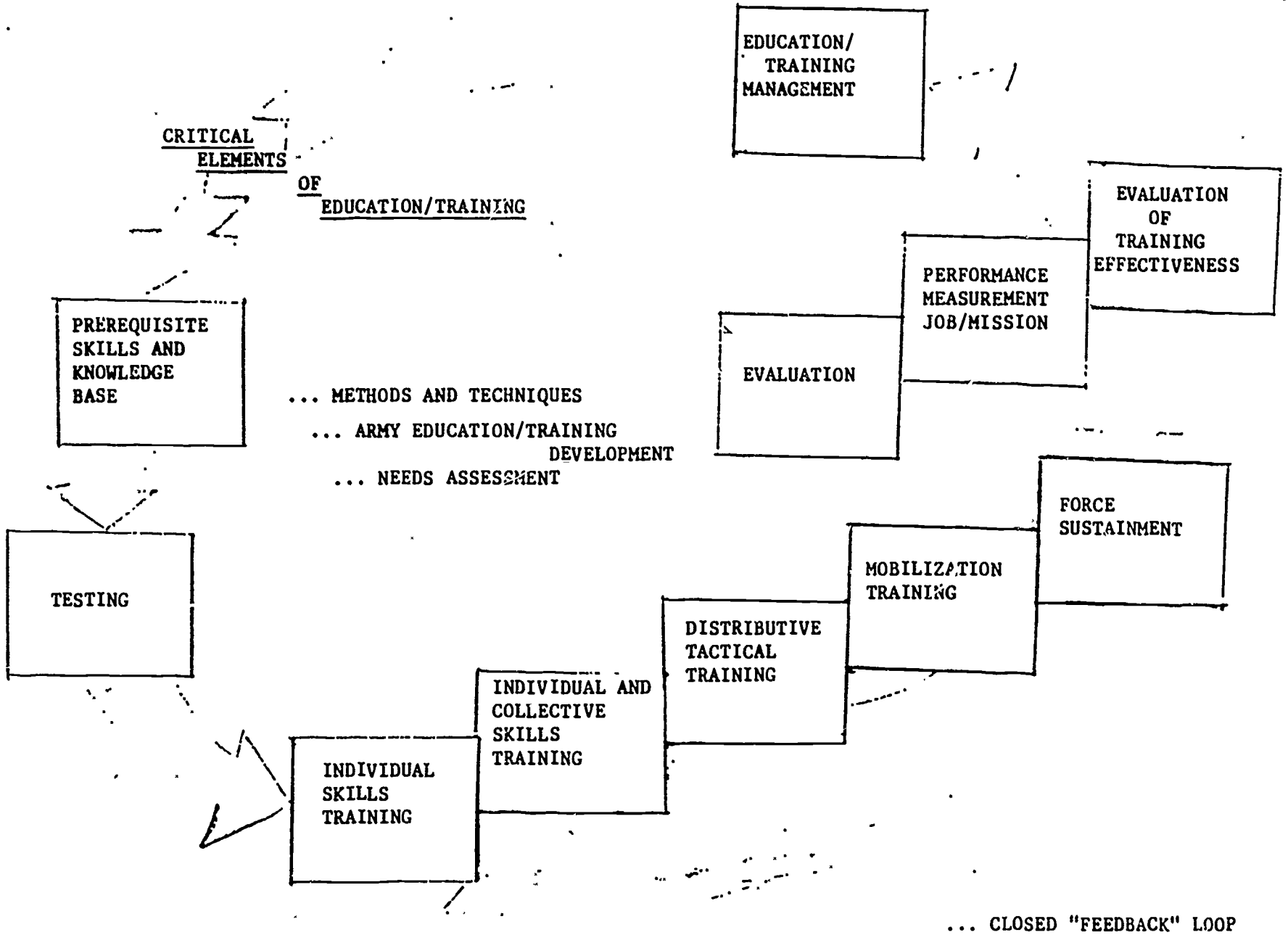
And fifth, is professional development for commissioned officers, warrant officers, non-commissioned officers, and Department of the Army civilians. Soldiers and Army civilian employees undergo these programs at various stages in their careers, usually in preparation for advancement. In addition, a large number of specialty courses and professional and personal development programs can be loosely included in this category: human relations programs, personnel effectiveness training. Much professional development occurs at the service schools in the Army's training base. Some soldiers and civilians are sent to military schools within other military services or to Department of Defense schools. Some go to civilian institutions within the United States and in foreign countries. Adult and continuing education programs (general education) provided by base education centers and

sub-centers worldwide generally fall into this category. Post-service education such as that provided by G-I Bill Education Benefits, Veterans Education Assistance Program or Army College Fund represents educational opportunties provided veterans either more or less as an award for honorable service (following World War II, Korean and Vietnam Wars) or as an incentive for initial enlistment (since the advent of the all-voluntary force in 1975). All five categories promote better individual and unit performance during peacetime, during mobilization and ultimately, during wartime. The Army education and training strategy provides criteria for standardization and for technology applications to training and education programs.

In addition, evaluations and lessons learned from training/education and field performance provide feedback to the strategy planners and programmers both in the operations and the personnel arenas to improve management techniques and systems development. The training research and development activities within Department of the Army, such as those conducted by the Army Research Institute, work toward the enhancement of education and training through developing model programs, applying advanced instructional technologies, and solving research questions.

CRITICAL ELEMENTS OF ARMY EDUCATION AND TRAINING

Perhaps another way to view Army education and training is to look at its interlocking critical elements (figure 2). One critical element is the caliber of personnel employed by the Army. The U.S. military services, often in conjunction and always in close coordination with the Department of Defense and the Office of Personnel Management, establish qualification and classification standards for employment or enlistment. These standards are set for prerequisite skills and knowledge deemed essential for initial employment and successful performance within the military organization. For the enlisted personnel in all military services, the Armed Services Vocational Aptitude Battery (ASVAB) is used as a screening instrument. A variety of other evaluation tools are used to screen officer candidates and civilian applicants prior to formal employment and service. Questions often arise concerning how well the military "represents" the U.S. population in general. The common assumption is that "being representative" is essential in a democracy and should be used as a criterion for assessing the success or failure of recruiting methods and outcomes (Department of Defense 1986b). In spite of some mitigating factors, a 1986 study group found significant similarities between characteristics of military personnel (both new recruits and the active duty enlisted force) and the U.S civilian population. Some of the similarities include (a) a fairly even geographical representation among new recruits, (b) minority representation of new recruits nearly identical to


EDUCATION/
TRAINING
MANAGEMENT
CRITICAL
ELEMENTS
OF
EDUCATION/TRAINING
EVALUATION
OF
TRAINING
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PERFORMANCE
MEASUREMENT
JOB/MISSION
EVALUATION
PREREQUISITE
SKILLS AND
KNOWLEDGE
BASE
... METHODS AND TECHNIQUES
... ARMY EDUCATION/TRAINING
DEVELOPMENT
... NEEDS ASSESSMENT
FORCE
SUSTAINMENT
MOBILIZATION
TRAINING
TESTING
DISTRIBUTIVE
TACTICAL
TRAINING
INDIVIDUAL AND
COLLECTIVE
SKILLS
TRAINING
INDIVIDUAL
SKILLS
TRAINING
... CLOSED "FEEDBACK" LOOP

FIGURE 2

proportions among the nation's youth population, and (c) occupational similarities. One major difference was that "military personnel tend to have higher levels of educational attainment and generally higher aptitude test scores than do their civilian counterparts" (Department of Defense 1986b:ix).

A second critical element is the conduct of the education and training programs. These programs may be individual skills training within the training base, individual and collective skills training in units throughout the world, distributive tactical and integrative training, mobilization training, unit endurance and performance training to include professional/personal development education aimed at force sustainment and quality of life.

Evaluation of the quality and relevancy of the programs is a third critical element. This entails both performance measurement and evaluation of overall training/education effectiveness.

A fourth critical element is training/education management. Management is responsible for needs assessment, education and training program development, and methods and techniques. It is "management" that must implement the strategy and make the process work, including incorporating evaluation findings into improved instructional programs. Management must maintain the prerequisite skills and knowledge base that helps set the standards for initial employment and then retention within the work force.

INDIVIDUAL TRAINING SYSTEMS

While other categories of education and training are often fully integrated into the general mission funding and become indistinguishable from normal military operations, the Army has a highly visible and well-defined individual training system with a budgetary line item. In the fiscal year 1986 (October 1,1985-September 30,1986), for example, the Department of the Army had approximately $7.4 billion to spend on individual training. This amount covered:

-Recruit and one-station unit training for approximately $770 million.

-Specialized skills training for approximately $1,661 million.

-Flight training for approximately $439 million.

-Medical training for approximately $296 million.

-Officer acquisition training for approximately $116 million.

-Reserve component pay and allowances for approximately $717 million.

-Professional development education for approximately $238.7 million.

Other costs were for training support, management, travel and pay. Included were audiovisual support, training development, base operations for the training installations, real-property maintenance, and headquarters management type activities (Department of Defense 1986a:X-4). The budget for general education (college tuition assistance, basic skills education, and Army Education Center operations) as administered through the Army Continuing Education System is approximately $115 million per year.

METHODS OF EDUCATION AND TRAINING

The U.S.Army subscribes to the "systems approach to training", better known to program developers as "instructional systems development" or ISD (Department of the Army 1982a). Simply stated, ISD consists of five instructional development phases: (1) analysis of the job and establishment of precise instructional parameters, (2) design of instruction, (3) development of instruction, (4) instructional program implementation, and (5) evaluation (see figure 3). ISD has strong behaviorist philosophical roots which extend back to B.S.Bloom's (1956) Taxonomy of Educational Objectives and to R.M. Gagne's "hierarchical model of learning" (Gagne & Briggs 1979). It emphasizes the importance of understanding what must be learned, careful structuring of instructional materials to allow this learning to occur, the use of instructional technology aimed at facilitating this learning, and both formative and summative evaluations to ensure that the designed and developed instruction accomplishes what it was intended to do.

In the early 1970s the Army commissioned a study to explore whether instructional technology could be used successfully in Army training (O'Neil 1979). This work found that Army training and instructional technology were compatible when instructional technology was considered as a set of development procedures rather than a collection of hardware and equipment. These procedures were expected to assist the Army with management training needed in designing and using instructional models and in identifying and capitalizing on successful programs already using technology (Logan 1982). In 1974, the Inter-service Training Review Organization (ITRO), consisting of the heads of the training commands within the United States Air Force, Army, Navy and Marine Corps, instituted a multi-service effort to develop a common doctrine and procedures for systematic development of training and education curricula. Appropriate training methods and media and instructional materials were to be an outgrowth of this systematic development. The ITRO effort was primarily funded by the Army through a contract with Florida State University. The project was supervised by a committee appointed by the ITRO. The result of this effort was a series of five volumes which became known as the

A Model for a Systems Approach to Training

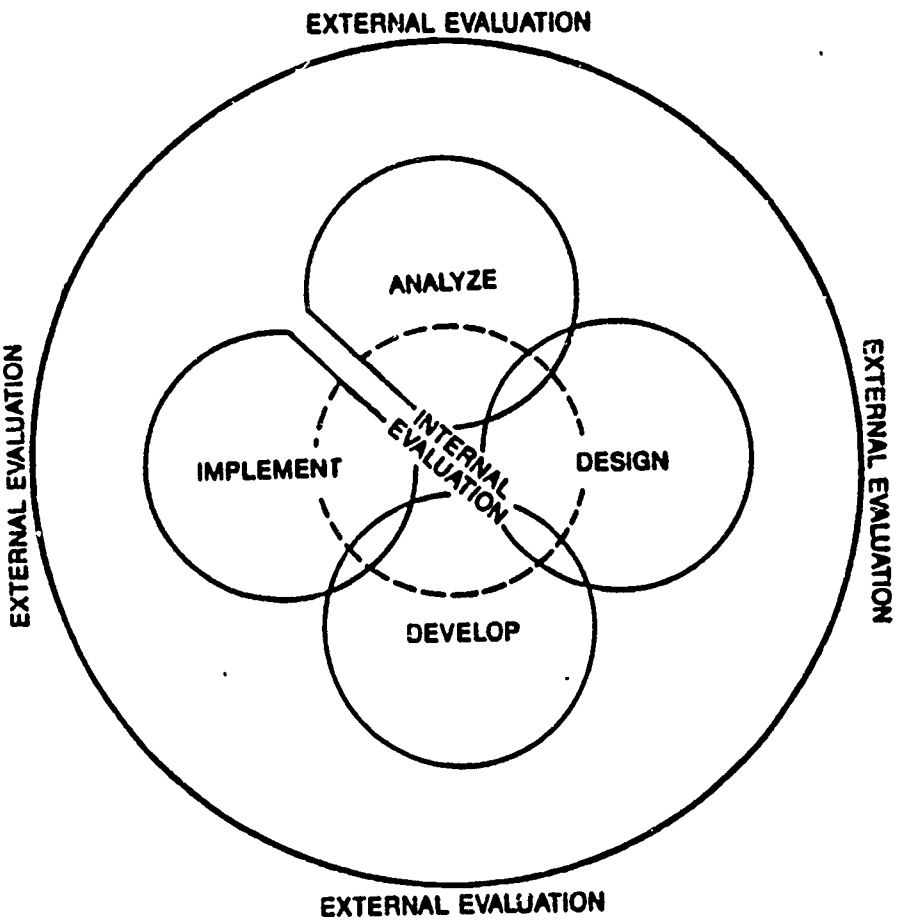


FIGURE 3

Interservice ISD Procedures (Branson, 1975 a,b,c,d,e). which has been described as "probably the most basic and authoritative document on that subject in the world" (Anderson 1986b:2). The ISD committee of ITRO intended that these inter-service procedures would become doctrine in each of the separate service training commands. Although not to the extent envisioned by the ITRO committee, a systems approach to training has been adopted by all the military services for their training development activities. In addition, many industries and businesses in the United States have adapted this model to their use. Logan (1982) has described, in some detail, ISD applications in research and practice as its influence and utility have spread around the world.

The "systems approach to training" does have its critics, especially among the adult education specialists in the Army. Even ISD's strongest advocates recognize that most teachers, whether in the military services or in the civilian sector, view themselves as humanists who are almost always concerned with the feelings, attitudes, beliefs, and values of their students; those things which make an individual distinctly human (Dick and Carey 1978). Separate adult education opportunities for soldiers apart from military training have a long and distinguished history in the U.S.Army and will be described in detail in the next section. These programs emphasize student goal-setting assisted by nondirective counseling. Soldiers engage in most of these programs and related activities voluntarily. Completion of most basic education and college programs rests on the intrinsic motivation of the learner. The adult educators appear to emphasize what Malcolm Knowles (1980) describes as the "educative environment" to include "respect for personality", "participation in decision-making", "freedom of expression and availability of information", and "mutuality of responsibility in defining goals, planning and conducting activities and evaluating" (Knowles 1980:67).

Critics of ISD often point to its mechanistic model which spotlights inputs, processes, products, outputs, and outcomes. Unless modified in practice by humanistic educators and trainers, the systems approach does not differentiate between felt and prescriptive needs. Generally ISD concentrates solely on prescriptive needs determined by a task analysis process. It allows for little, if any, consideration for personal dilemmas of educators or trainers. ISD depends on a thorough organizational needs assessment for training (i.e., front-end analysis) and extensive formative and summative evaluations which usually require enormous amounts of time and resources. Few military organizations are willing to wait and/or allocate sufficient money and skilled manpower to allow these phases of the systems approach to function as intended by its designers. The often intense and immediate organizational pressure to have so-called quality instruction implemented now can not

be adequately accommodated by ISD. Consequently, in practice, short cuts are taken which result in performance outcomes that are less than desired. By the mid-1980s, a sense of dissatisfaction seems to surround Army instructional development. A U.S.Army Training Board Report (Department of the Army 1985b:2) charged that Army training products were not standardized, were often contradictory, and failed to use the full capabilities of U.S. soldiers. The Training and Doctrine Command Commander expressed concern over the "atmosphere " of the Army classroom (Richardson 1984). As the U.S. strives for tactically and technically proficient soldiers, questions concerning instructional methodolc 'ill continue to surface.

ARMY CONTINUING EDUCATION SYSTEM

Historically, the roots of the Army's educational program extended back to the American Revolutionary War. In 1778, General George Washington, through his chaplain, provided basic academic instruction for his convalescing illiterate soldiers at Valley Forge (Wilds 1933). Later, in 1838, Congress took note of the educational needs of soldiers when it first authorized "post schools" for illiterate soldiers (White 1968). The United States Congress in June 1916 formally recognized service members' needs for civilian adult continuing education with its passage of 10 United States Code 4302. This paragraph in the American legal code states that if enlisted members of the Armed Forces desire to attend school, they " shall be permitted to study and receive instruction to increase their military efficiency and to enable them to return to civilian life better equipped for individual, commercial, and business occupations." From those early beginnings and the authorizing legislation, a formal Army educational program, as implemented today, originated in the Morale Branch, Office of the Chief of Staff, United States War Department, in March 1941. During the following year the tuition assistance program was first established by Congress as part of the Fiscal Year 1942 Appropriations Act. This program defrays educational tuition costs for off-duty educational courses, particularly those in college programs. Normally each annual Department of Defense Appropriations Act contains specific budget line items for tuition assistance, basic education, education center operations, and veterans' education assistance. Only briefly (25 October 1943 to 10 November 1943) has the Army education program been an integral part of Army training. During that short period, Army education was a function of the Director of Training, Army Service Force. Information and Education Officers were made Assistant G-3s (training) in all ground forces units. Following that brief period, education at Headquarters, War Department, later Department of the Army, level was under

the Office of the Chief of Information until 1956 (Strehlow 1967).

Effective October 1956, troop educational activities and troop information were divorced. Responsibility for developing policy regarding off-duty Army education was transferred to the Office of the Deputy Chief of Staff for Personnel (ODCSPER) under its Human Resource Development (HRD) Division. Development and operations of Army Education Centers became a function of the Army's The Adjutant General (TAG). Education in the Army became more identified with, and supportive of, personal development and fulfillment of human needs for esteem and self-worth, considered at that time to be "prestige objectives." From this action came the term "General Education Development (GED)." Field commanders were made responsible for educational programs for their troops. Army Education Centers were located throughout the Army where sufficient troop concentrations would permit their establishment and maintenance (normally wherever 750 or more troops were located on permanent duty status). Education sub-centers could be operated at locations with fewer personnel. These centers and sub-centers were designed to be closely allied with educational needs of soldiers and with the units' missions at those specific locations. Responsibility for the organization and conduct of off-duty educational programs for military personnel was placed in the hands of professional civilian educators, employed as staff members of the commanders at major Army headquarters and at posts, camps, and stations throughout the world.

In 1974, most of the policy-making responsibilities shifted to TAG as a separate division of ODCSPER. By 1977, the name "GED Program" had changed to the "Army Continuing Education System" or "ACES". This change was intended to refect the Army's education program's evolution into an integrated system of voluntary career and self-development educational opportunities. Component programs were to interface with and impact upon each other in a manner which would foster maximum development of individual soldiers, regardless of educational achievement when entering the system. By 1984, the HQDA staff proponent for education had moved back from TAG to ODCSPER. This time education policy was made integral to its Military Personnel Management Division. This change seemed to refect an increased recognition of the importance of education to soldier recruitment and retention.

The struggle over which Army staff agency should be the proponent for Army continuing education has been rooted in the diverse missions and functions expected of education (soldier morale and unit esprit de corps, military training support, satisfaction of human aspirations, and fulfillment of military personnel management objectives). The principal issue over the years, however, has been whether or not continuing education should be integral to military training or kept separate and distinct from military training. One

Army educator seems to have captured the essence of this problem:

> It isn't training versus education; it is training and education. That is the key. They cannot be competing, yet they have to remain distinct arenas. (Quotation from E. Robert Lord found in Anderson 1986a:242)

The current governing policy for Army continuing education can be found in Department of Defense Directive 1322.8 (1980) and Army Regulation 621-5 (1985c). Simply stated, ACES offers in-service continuing education programs and services tailored to meet both organizational and individual soldiers' needs. As a system, ACES is tasked to follow through on Army educational commitments to support recruitment and retention objectives and help military job performance. ACES supports total Army readiness, but the fundamental assumptions upon which the system is based are:
-That an individual can improve both skills and knowledge through education;
-That the process of learning is continuous and progressive;
-And that educational opportunities should include a wide range of programs and activities.

The organization and administration of ACES consists of approximately 660 Army education centers and sub-centers normally managed by civilian education services officers or specialists. All major Army commands and regional commands within United States Army, Europe, have Directors of Education, generally Department of the Army civilians. ACES policy and program guidance are functions of the Education Division, currently located within ODCSPER, HQDA. (See figure 4 for diagram depicting ACES policy and programming guidance channels.) In aggregate, ACES is staffed with over 1300 professional educators, counselors, and administrators. Most instructional programs and educational services beyond counselling are done through non-personal services contracts with educational institutions, civilian companies and, in some few instances, with individuals.

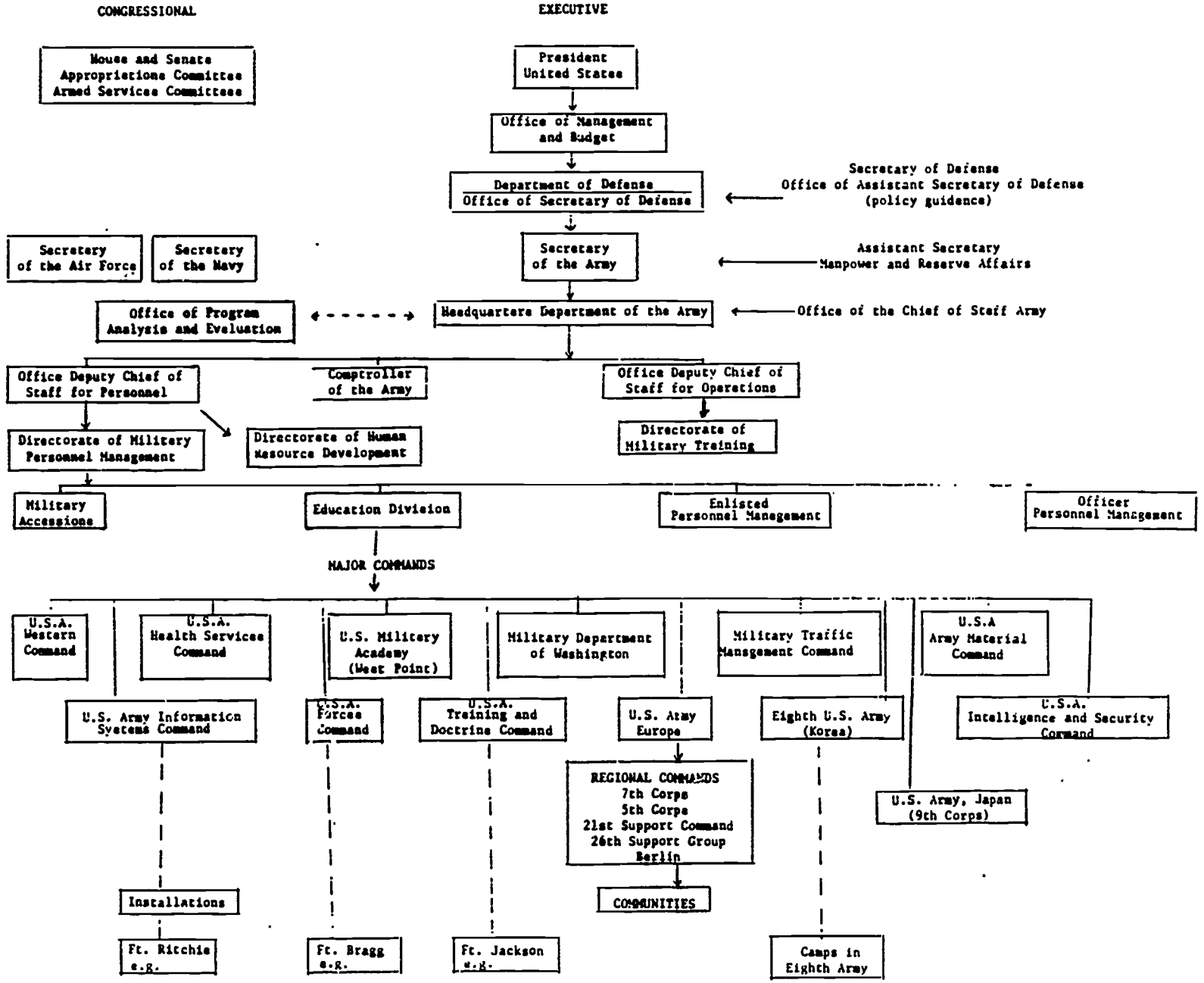
Military adult family members, civilians employed by the Department of the Army and other DOD agencies and their adult family members are part of ACES educational services planning. They are encouraged to participate in ACES-sponsored programs on a space available unless precluded by directives originating outside of ACES.

ACES relies heavily on educational needs assessment, specifically updated at least annually, to align its capabilities to the Army posture and to prospective students' felt needs. ACES program thrusts are outlined:

First, ACES's primary programmatic endeavor appears to be in providing high quality continuing vocational skills and adult academic opportunities to meet the expectations of enlisted soldiers who are high school diploma graduates with

FIGURE 4

ACES POLICY AND PROGRAMMING GUIDANCE CHANNELS



above average mental capabilities as measured by the ASVAB. In-service college programs, vocational skills training, and testing which can result in the award of college credit and/or certification are designed to follow through on Army education and training promises made during soldier recruitment and subsequent reenlistment processes. By being provided viable in-service educational opportunities, high caliber soldiers are assured that their educational aspirations can be achieved while as they pursue a military career. They can use their veterans educational benefits such as those provided through the "Army College Fund", the Veterans Education Assistance Program, and the G-I Bill either by reenlisting in the active force or by enlisting in one of the Reserve Component units. ACES assists the soldier in understanding educational benefits and entitlements through nondirective counselling.

This counselling is conducted periodically throughout a soldier's active military service to include a counselling session shortly prior to transition from active duty to civilian life. Networking of associate and bachelor degree programs, as done through the auspices of the Servicemembers Opportunity Colleges (SOC), assists the soldier-student by limiting college residency requirements, easing the acceptance of transfer credits among member institutions, and recognizing experiential learning accomplished through the military and by other nonacademic means in terms of college credits that may be applied toward a degree program. (Over 600 U.S.civilian colleges and universities have voluntarily subscribed to the principles and criteria of SOC and are designated as SOC institutions.) These counselling and program networking efforts seem to have helped forge a positive connection among in-service education opportunities, the use of veterans' education benefits and continued military service within a total Army concept. In order to be effective, academic credits and degrees, vocational skills training and certification resulting from in-service education must interface closely with veterans' continuing educational achievements and with veterans' ability to compete in the civilian job market once transitional from military service.

Second, ACES assists the individual military training establishment with soldier basic skills remediation opportunities. In addition to forming a literacy foundation for further educational achievement, the mastery of such skills as reading, writing, basic mathematics, and verbal communications is essential for military job performance and for military job training. ACES helps the Army Training System identify basic educational skill requirements for military occupational specialty training and on-the-job task performance. Specially designed and validated tests assess whether soldiers have, indeed, mastered essential basic skills requirements. For remediating deficiencies, instructional programs have been developed which tailor lessons to help alleviate a soldier's identified basic

skills problem or problems. Instruction is made available during nonprime training time for soldier development. Basic skills mastery, or the lack thereof, is being increasingly reflected in military personnel management decisions such as in reenlistment, additional military job training, and selection for promotion. ACES has the responsibility to serve as a conduit to the secondary and adult educational communities in the United States by passing along identified basic skills requirements to civilian educational systems wanting to upgrade curriculum requirements to ensure their graduates meet the basic skills standards essential for the military work force. In this regard, ACES is a cooperating partner in an on-going Adult Literacy Initiative sponsored by the U.S. Department of Education. A more detailed profile of the Army's Basic Skills Education Program will be presented in the next section.

Third, ACES assists soldiers and military family members in developing general language proficiency and communications skills both in English and in languages other than English. As an part of the Defense Language Program, ACES takes a leading role in assuring that soldiers have sufficient English language skills to perform their military jobs and maintain unit cohesiveness through a common operational language. ACES also provides host nation language and cultural orientation designed to help American soldiers and their families adjust to their foreign environments. For Army linguists, Army education centers assist with refresher language training. Even though many language instructional opportunities occur within military intelligence, security, and special forces units, or in Defense language schools, Army education personnel can guide linguists and others in need of language training into available language training activities. Often language laboratories are part of the installation Army Education Center operations. In those cases, soldiers and family members can use the self-paced, self-instructional tapes and texts available in the language laboratory library.

Four, ACES provides mechanisms whereby soldiers can document the skills and knowledge learned while on active military duty. Through the Army Apprenticeship Program, vocational testing and the Army Transcript Registry, soldiers can produce the necessary documentation to describe accurately and in meaningful terms the learning and experience achieved through active military service. This documentation is designed to help civilian school registrars, industry and labor organizations understand the military service background and work experience being presented by the applicant. Often advanced placement is awarded based on this documentation.

Five, ACES is challenged to contribute, in a major way, to the non-commissioned Officer (NCO) development activities at installation or community level. ACES provides instructional resources and programmatic initiatives to upgrade leadership, supervision, administration, and

communication skills of NCOs who have the primary responsibility of supervising and training recruits and first-term soldiers. ACES supports the academic preparation of NCOs who are scheduled to participate periodically in career development training courses relevant to their military occupational specialties or their specific career management fields. Local education services personnel assist the local training establishment in both planning and implementing these types of NCO educational activities to meet organizational need.

Six, ACES conducts a continuous outreach program in striving for excellance in education. It is responsible for marketing education within the total Army. This outreach includes providing support wherever needed in the education of the whole military family. In some cases, ACES personnel assist with such family education areas as a) financial aid to communities with dependent schools, b) administrative and logistical support for overseas dependent schools, c) participation of adult family members in educational opportunities for soldiers, d) handicapped persons' education, and e) education for the gifted and the extremely talented family members. Other outreach areas involve educational services for Reserve Component personnel, educational programs and services for soldiers located at isolated places both in the United States and in host nation areas, and close cooperation among ACES and educational programs and services provided through other military services and through the state education systems. In striving for excellance, ACES has an obligation to provide high quality instructional programs aimed at meeting specific soldier needs in a timely and cost-effective manner. In order to accomplish this ACES attempts to use, when and where possible, advanced educational technology to include interactive and automated instructional systems. It uses computer systems for information management in the administration of education programs and activities. It works cooperatively with the Army Research Institute in operationalizing appropriate educational technology projects as resulting from successful research and development.

Seven, ACES has a major role in maintaining an effective civilian education career field in the federal government. This education career field must be able to attract and maintain qualified professionals to serve in the Army as directors of education, education services officers and specialists, and guidance counselors. These Army education staff personnel are key in fostering cooperative education ties among the Army, other military services, and the civilian education communities. In CONUS, these professionals are required to work with local civilian, state, federal, and institutional representatives in order to provide a full range of programs and services. ACES staff personnel are active on state military education advisory councils and often represent the Army at state and institutional meetings where education policies involving the military are formulated and state education planning is conducted. In oversea areas, the education staff officers must work with host nation personnel to meet specific educational requirements of those military commands. ACES staff personnel work with regional and national accrediting associations to assure quality of on-base instructional programs. They serve as the government's contracting officers technical representatives in preparation and execution of educational contracts. Staff training and development activities for ACES personnel are essential program elements in maintaining a competent work force.

CHALLENGES FOR ARMY EDUCATION AND TRAINING

Throughout the history of the United States Army, a key manpower question has been what to do about the under-educated or lower aptitude youths who comprise a significant segment of the young adult population . It is from this group that the military services have traditionally drawn new members either by recruitment or induction (Sticht 1982). In times of war, heavy manpower requirements have required Army personnel managers to lower the desired minimum qualification standards for entrance and continued military service. Consequently, significant numbers of the illiterate and marginally literate individuals have served during those periods (Anderson 1986a). The advent of the all-volunteer Army in the mid-1970s, with its continued maintenance of rather large numbers of active duty soldiers, has kept the spotlight on recruitment and retention of so-called "quality" personnel. With the heavy use of education incentives such as the "Army College Fund", Army recruiters and reenlistment personnel have enjoyed a fair measure of success since 1981 in obtaining and retaining high school diploma graduates. (See figure 5 for active Army enlisted recruiting trends.) Dispite this, in 1984, when over 93 percent of the active Army recruits were high school diploma graduates or had earned a GED high school graduate equivalency certificate, over 26 percent were considered to be in Mental Category IIIB (expected reading ability of between 8th and 9th grade level) and an additional 10 percent in Mental Category IV (expected reading ability of below 8th grade level (Anderson 1986). The General Accounting Office (1977) found that, when compared to the normal recruit population, poor readers a) have higher discharge rates, b) experience more difficulty in training, c) perform less satisfactorily on the job, and d) lack the potential for career advancement.

The manning problem has been exacerbated by the ever-increasing technology push in weaponry and in fighting doctrine. During the 1980s, the Army's Force Modernization Program has produced over four hundred major new systems of sophisticated military hardware. Army 21 fighting doctrine envisions that soldiers will operate and maintain this high-technology equipment on an extended battlefield in isolated units on a continuous operations basis with disrupted logistical support (Department of the Army 1985a). Soldiers must demonstrate the capacity to be flexible and resourceful, not only to survive, but to defeat an aggressive enemy force on a modern battlefield. Soldiers must be able to "swarm" from those small isolated positions, hit enemy forces with crushing blows, and "scram" back into small isolated positions to assess the results, plan and take subsequent actions until the enemy is defeated. Synchronization becomes key to successful operations (DePuy 1984). Soldiers must be both technically and tactically competent.

FIGURE 5

Active Army Enlisted Recruiting Trends

	FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85
Non-Prior Service Total Accessions	168,398	124,029	129,284	158,179	117,915	120,353	132,771	131,702	125,443
Formal Education									
HS Diploma (%)	59.2	73.7	64.1	54.3	80.3	86.0	87.6	90.8	90.7
GED (%)	3.9	3.5	5.0	3.7	3.1	2.8	4.3	3.0	3.0
No Diploma (%) or Certificate	36.9	22.8	30.9	42.0	16.6	11.2	8.1	6.2	6.3
Test Score Mental Category									
1-111A (%)	34.2	37.9	30.6	26.0	40.0	53.0	61.4	63.4	62.9
111B (%)	22.0	22.7	23.4	22.1	29.1	27.8	26.6	26.4	28.5
IV (%)	43.8	39.3	46.0	51.9	30.9	19.2	12.0	10.2	8.6
Blacks (%)	29.4	34.3	36.8	29.8	27.4	24.6	22.0	22.6	22.5

NOTE: From ODCSPER, HQDA (DAPE-MPA-EA) March 15, 1985; updated November 15, 1986.

U.S. military planners such as Paul Chatelier (1980:3) have expressed concern: "Technologically sophisticated hardware doesn't mean much if people can't operate or maintain it. The 1984 Army Science Board Report on Leading and Manning concluded that "officers lack adequate written and oral communication skills" and that "testing of basic intellectual skills is not consistently executed either in pre-commissioning education or in the TRADOC (U.S Army Training and Doctrine Command) school system" (Department of the Army 1984:61). A disconnect between skill performance requirements for operators and maintainers of new weapons systems and the capabilities of the available manpower can be projected based on past experience (Gorman 1981). Assignment of low-technologically oriented soldiers to operate and maintain high-technology equipment presents a host of unsolved education and training problems.

Normally military training and education have emphasized procedural learning, based on mastery of predetermined sets of military performance tasks, including their conditions and standards. These have been generally determined by analysis in instructional systems development. This type of learning may be insufficient to prepare soldiers to be able to think and reason under tremendous stress. Often soldiers are required to act creatively, timely, and forcefully, in circumstances not covered in this type of procedural learning. Additional learning, to include hypothetical deductive reasoning, may be required through which soldiers can quickly synthesize technical data and other information in order to be able to act effectively and accomplish their military missions. More reliance on interpersonal communications or learning through dialogue and self-reflection may be necessary in order for soldiers to be able to sort out, individually and collectively, what is valid and critically important within specific circumstances, and to determine what actions are to be taken (Mezirow 1985). If free to operate as responsible, rational, and autonomous persons, within a group, technically competent soldiers may be able to learn to function more effectively in this manner.

Development of soldier skills in dialogic and reflective learning should enhance real time effectiveness in maximizing the elements of surprise, cohesion, and unpredictability. Basic education may not focus only on reading, writing, oral/aural communications, and mathematics needed for military job performance, but also on computer literacy, information management, and abilities to think, reason, and problem solve under stress. Learning strategies targeted at helping soldiers learn and use varied processes for thinking and acting based on thought or reflection may become a key element in Army education of the future. College program opportunities may emphasize courses in information management, languages, and computer studies. Demonstrated abilities in written and oral communications may become increasingly significant elements in graduation

requirements for both the associate and the bachelor degrees.

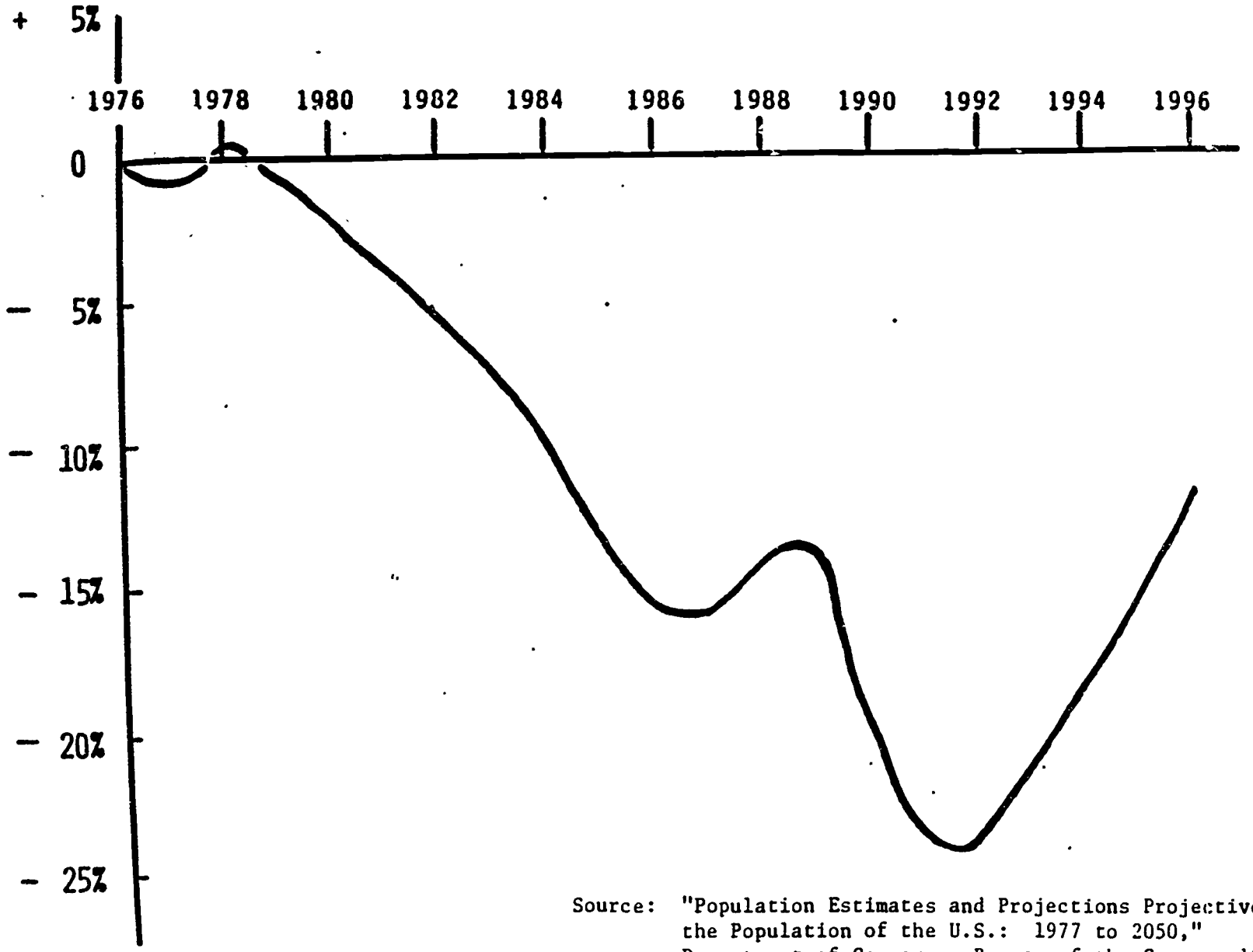
Some potentially adverse factors cloud the recruitment of Army personnel during the late 1980s. First, the U.S. Department of Commerce (1977) statistics show a 25 percent drop in the seventeen to nineteen-year-old United States male population between 1978 and 1992 (see figure 6). This downward trend in the available manpower pool not only affects Army recruitment but also that of the other military services and of industry and colleges throughout the nation. Second, as the young male population declines, a higher percentage of the available manpower pool will have limited English-language proficiency (Oxford-Cartenter,Pol & Gendell 1983). (See figure 7.) About 23 million United States citizens age five or over speak a language other than English in their homes, principally Spanish. The lack of proficiency in a common language compounds soldier comprehension difficulties and destroys that instantaneous communication capability which is essential in military operations in a technologically-oriented Army. Third, some studies commissioned by the Armed Forces have indicated that "mission-inhibiting attitudes" may complicate both the initial recruitment and then the fighting ability of soldiers inducted in the Army of the future. "Mission -inhibiting attitudes" may include a) demands for excessive creature comforts and equipment standards and an unwillingness to endure the hardships of a battlefield environment; b) dedication to an anti-nuclear weapons movement, unilateral or unbalanced disarmament; c) espousal of anti-involvement philosophies; d) work to rule advocacy to include unionization of soldiers; and e) participation in deliberate civil disobedience (Andrulis Research Corporation 1982). The attitudes of soldiers refect generally the attitudes of the United States population in general. Attitudes have a strong bearing on motivation. Lack of positive motivation appear to have an adverse impact on both individual and unit training and mission accomplishment. The U.S. Air Force, perhaps better than the Army, has recognized this potential problem by this statement in one of its long-range planning documents:

> The principal challenges facing the Air Force in manpower, personnel, and training through the year 2000 focus on instilling and perpetuating a war-fighting spirit and perspective among Air Force people. (Department of the Air Force 1981:18)

Apparently, the Army will attempt to meet the challenges for Army education and training by a three thrust approach: First, the Army will attempt to keep enlistment qualifications as high as possible and still achieve the needed numbers to meet manpower strength authorizations. Wherever possible, it will encourage pre-enlistment basic skills development of prospective recruits so they will be

FIGURE 6

PERCENTAGE CHANGE IN 17 TO 19-YEAR-OLD U.S. MALE POPULATION, 1979-1996

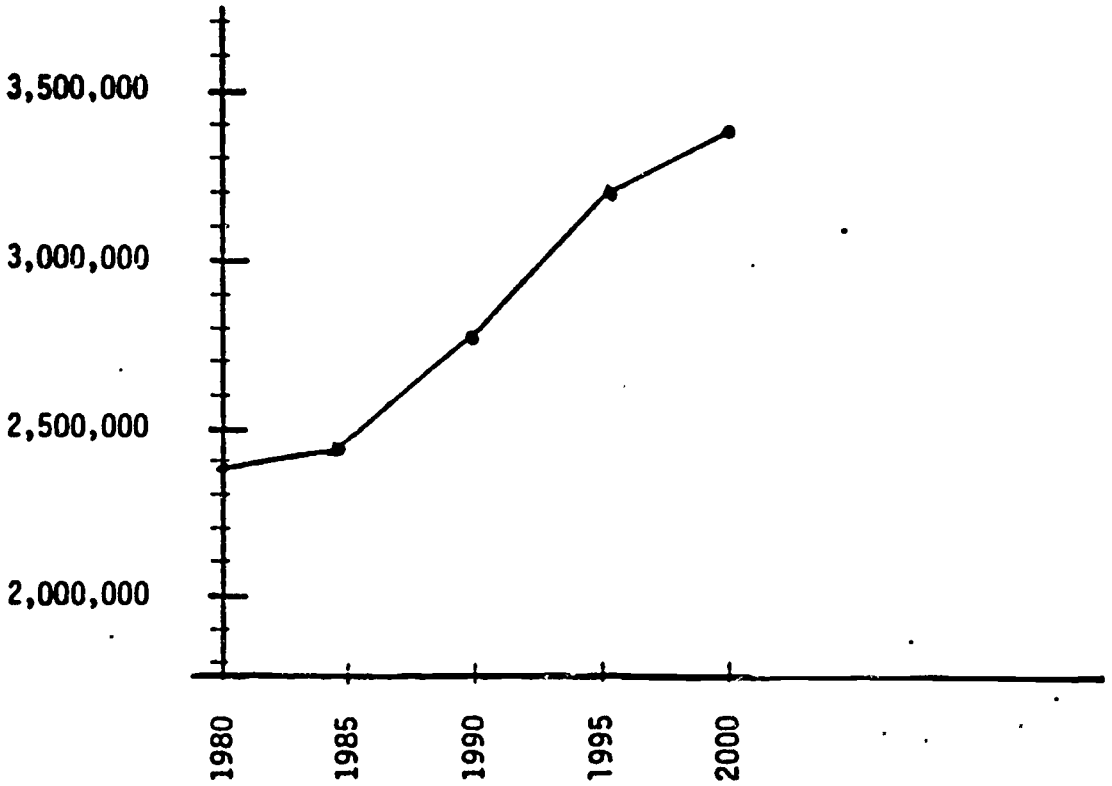


Source: "Population Estimates and Projections Projective of the Population of the U.S.: 1977 to 2050," Department of Commerce, Bureau of the Census, 1977

FIGURE 7

US POPULATION PROJECTIONS OF LIMITED ENGLISH PROFICIENCY AGE GROUP 5-14 YEARS

(Does not include Puerto Rico)



Source: Oxford-Carpenter, Pol & Gendell, 1983

capable of meeting high entry requirements. In addition, other military personnel management standards--such as promotion and reenlistment standards--will reflect mastery of basic skills and higher education achievements. Second, the Army will continue its on-going efforts to lower the requirements for academic skills necessary to use and maintain Army equipment. Man-machine interface endeavors are expected to result in high-technology equipment design and production that will allow low-technology oriented soldiers to operate and maintain it with relative ease. In addition, the Army will continue its efforts to make its technical, training and administrative publications more readable and usable. Third, the Army will continue in its attempt to provide high quality instructional training and educational programs to meet job performance and human needs.

Perhaps one area that should be addressed as part of this third thrust is the potential for advanced instructional technologies. For example, through the use of video and audio technology, a student or students can be placed in a naturally rich learning (simulated) environment with opportunities to interact with that environment and have some measure of control over that environment. Learning that occurs is expected to prepare the student not only to survive within that environment if encountered in real life but also to function up to full human potential whether on a lethal battlefield or in real life peacetime situations.

Within military training, the Defense Advanced Research Projects Agency (DARPA), in cooperation with the U.S.Army, as part of its advanced research on interactive simulator networking, has established a project at Fort Knox, Kentucky, called "SIMNET". The purpose of this project is to enhance the opportunity for units to practice collective, combined arms, war fighting skills in fully crewed, fully interactive, high quality simulators at very minimal cost in terms of equipment and personnel. Core technologies of SIMNET include local and long-haul digital networking, distributed computing, high speed microprocessors, hybrid depth buffer graphics, special effects technology, selective fidelity design principles, and unique simulator fabrication techniques. DARPA and the Army are fielding this test bed in the context of a close combat heavy land battle featuring simulators for tanks, mechanized infantry fighting vehicles, fire support, maintenance, and command and control elements.

Some curriculum developers are now exploring video and audio technologies specifically to enhance "transparency theory". The primary premise of the "transparency theory" is that of "tacit holism" (Wilson & McCullough 1986). Wilson, McCullough and other curriculum developers at Haseltine Corporation have been developing a new survival-level Spanish course for a federal agency. Instead of using the traditional method of dividing the complexities of the Spanish language into small bit-size pieces (which theorically would be easy to digest in procedural learning), they place the student in a "contextually comprehensive

environment" through the use of the micro-computer and video-disc. The student interacts either actively or passively in this environment thereby building the necessary language skills to survive in a simulated but realistic situation. Wilson and McCullough describe this methodology:

> The form that constitutes a 'contextually comprehensive environment' is basically a simulated situation in which the presentation of information, using realistically contrived video sequences or computer generated graphics, may contain far more verbal information than the target population of learners is actually expected to understand. The situation is structured with enough realistic visual and auditory cues to provide the learner with a 'comprehensible input' (Wilson & McCullough 1986:5,6).

These two efforts, described above, simply demonstate a potential for advanced instructional technology in providing relevant education and training for future soldiers. The methodological implications of advanced instructional technologies may have wide-ranging applicability.

The Army's attempt to reduce, if not totally eliminate, its problems of illiteracy and marginal literacy mainly through enforcement of tough recruitment and retention standards is not without controversy. Many Army leaders appear to view under-educated or lower aptitude individuals in a way similar to civilian employers. Yet, the problems of marginal literacy among high school diploma graduates persist as noted by the Army's Basic Skills Education Program. In 1984 ACES had over 240,000 enrollments in its basic education programs. (Enrollments do not indicate number of soldiers; marginally literate soldiers could enroll in several courses within a year.) One issue with the recruitment policy of the 1980s is that it cuts back on opportunities for minorities, particlarly Blacks and Hispanics, to leave urban ghettoes and, through military service, develop better lives for themselves and their families. (See figure 5 for trend in Black recruitment.) Previously, the Army had offered a significant escape valve for these groups and a way for many individuals to become better assimilated into the mainsteam America. Although recent Army policy puts increased pressure on prospective recruits to complete high school and develop mastery of basic skills within their own civilian environments, these environments often do not allow this to occur (Hard times close Army's ranks to inner city's would-be recruits 1983).

A second issue involves whether the Army, in peacetime, should train and educate illiterate and marginally literate recruits as a needed strategy for possible mobilization. In war, vastly increased manpower

requirements would, in all likelihood, require the use of large numbers of illiterate and marginally literate personnel just as in World War II. Without the experience of training/educating and using these types of personnel, the Army may be at a severe disadvantage in preparing its cadre for wartime situations.

A third issue involves the pitfalls of educational technology. Historically, the promises of educational technology in the United States often turn out to be "fads" that come in with great fanfare one moment and are scrapped for a newer panacea the next (Office of Technology Assessment (OTA) 1982). In observing Army training and education over the past twenty-five years, this writer has found the Army not immune to this phenomenon. For example, the Bessler Cue-See machine was brought into the Army in the latter half of the 1970s as the "standard Army teaching machine" for Army training. Many of these machines appeared to be quickly and neatly stacked away along with their courseware to gather dust. Language Laboratory equipment seemed to suffer the same fate. The newer interactive computer systems seem to be expensive to operate and maintain with much of the current courseware simply a page-turning exercise or a talking head. While observing automated systems sitting idle or doing what could be done less expensively and just as effectively by more traditional means, a researcher could well ponder OTA's premise that valuable resources were being squandered. Yet, considerable evidence exists that modern society and the United States Army which mirrors that society are undergoing an "information revolution" characterized by explosive developments in electronic information technologies that offer potential for education. As one Army educator pointed out:

> The technology has the capability of placing at the finger-tips of any instructor, a cornucopia of resources; an instant library that can be accessed easily, quickly for virtually any kind of information. (Quotation from Michael Biebrich found in Anderson 1986:255)

A central problem in the use of technology-oriented instructional systems seems to focus on the role of the human instructor or learning facilitator. Few Army trainers or educators openly advocate a stand-alone automated system for learning. Yet, the role of the human element does not seem to be defined. Little, if any, staff development can be observed that would help instructors, teachers, counselors, and administrators understand the potential value of technology in creating a richer learning environment than currently available. On the contrary, the use of automated systems seems to be often viewed as a threat to their very existance instead of being a valued extension of their capabilities to provide

optimal learning opportunities for their students. Emphasis seems to be placed on acquisition of hardware and the development of software and courseware. The missing ingredient may be "warmware", the human technology needed to bring about optimal use of automated instructional systems.

EXPECTED TRENDS AND DEVELOPMENTS

Requirements for education and training in the U.S.Army. are not expected to diminish. Manpower availability problems, coupled with increased training requirements, may even expand the need for education both as incentives for recruitment and retention and also for military job performance. A continuation is expected in the use of pre-service, in-service, and post-service education incentives in order to attract and retain "high quality" soldiers. Continuous review and assessment of education and training needs must occur. In the assessment of need and establishment of goals in the area of continuing education, strong consideration should be given to human needs and aspirations as well as to organizational needs and support for military training requirements. Language training may receive renewed emphasis both in the area of English for common usage within the Army and in other languages needed by soldiers and their family members.

Fresh new approaches in instructional methodology need to be developed, particularly within the learning strategies area to enhance soldiers' ability to think and to act based on those thoughts. Research and development is needed on methods "to teach" these learning strategies. Perhaps an increased emphasis on independent study/research and self-directed learning would assist in this effort. Low cost simulations and simulators are expected to be used to promote situational learning.

Advanced training technology will also be included in new equipment systems design to help produce high-technology weapon systems and their support systems that are more easily used and maintained by low technology-oriented soldiers. Research is needed in special training/education requirements for low aptitude soldiers so that these personnel can be permitted to enter the Army and be expected to function effectively on a modern battlefield. Development and validation of standard soldier readability specifications could assist writers and editors of Army training and administrative publications. More emphasis will be needed on the use and maintenance of automated systems. It is hoped that the necessary "warmware" will be developed to help instructors and administrators integrate automated learning systems as part of their ability to provide optimal learning situations for their students. Continued separation of the Army Training System and the

Army Continuing Education System is expected. Army leaders must be reminded periodically that ACES must maintain a balanced education approach among its primary requirements a) to help meet military personnel management objectives, b) to support military training needs, and c) to meet human aspirations and felt needs for education. ACES seems to have an especially important role in helping soldiers and their family members develop positive attitudes about military service to their nation and their responsibilities as representatives of the United States when serving and living in host nations. Within ACES, increased integration of educational opportunities will occur with the Reserve Component forces. Consideration should be given to inclusion of most, if not all, Civilian Component education programs under the ACES's umbrella in order to promote a "total Army" concept. There will probably be a greater interlocking of pre-service, in-service, and post-service educational programs and activities for all components.

There will be increased concern among Army leaders regarding soldiers' values and human goals. Like the Air Force, the Army may come to the realization that instilling and perpetuating a war-fighting spirit and perspective among soldiers may be its greatest challenge.

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