Research Note 85-46

Job Skills Education Program: Phase I Report

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Beatrice J. Farr, contracting officer's representative. This report, together with RNs 85-22, 85-37, 85-40, 85-41, 85-42, 85-43, 85-44, 85-45, and 85-47, forms part of a series on the Army's Job Skills Education Program (JSEP).

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

The Job Skills Education Program (JSEP) is designed to provide soldiers with the prerequisite knowledge and skills required for successfully learning their Military Occupational Specialties (MOS). When the JSEP is put into effect, it will replace the Army's current Basic Skills Education Program (BSEP) with a sophisticated, computer-based system. This report details the managerial and production efforts of the JSEP, Phase I.

FOREWORD

The Job Skills Education Program (JSEP) is a multi-phase program begun in Fiscal Year 1982, and designed to enhance enlisted career potential by improving soldier job performance. The sponsor, the Education Division, Office of the Deputy Chief of Staff for Personnel, expects JSEP to replace the Army's current Basic Skills Education Program when it is implemented.

The JSEP program, being developed by Florida State University (FSU) will result in a standardized curriculum for soldiers who demonstrate deficiencies in the knowledge and skills required to successfully learn their Military Occupational Specialty (MOS).

In accordance with current policy, JSEP will be an on-duty program. It will also use a computer-based management system to facilitate an open entry/open exit approach. At present, most of the lessons being developed will be computer delivered; however, the plan calls for using existing materials, and incorporating materials developed as part of other ARI efforts, whenever appropriate.

A unique aspect of JSEP is that it builds upon a very detailed front-end analysis of MOS Baseline Skills. The analysis covered tasks performed by soldiers in the 94 highest density MOSs, in addition to Common Tasks (the skills that all soldiers, regardless of their MOS, need to know). Although the Army has over 300 MOSs, the 94 covered in the analysis represent about 80% of all soldiers. Perhaps the most useful product developed for the analysis was a *taxonomy* listing more than 200 prerequisite competencies.(P.C.) for these MOSs. The competencies were derived from detailed reviews of Soldier Manuals, and from extensive interviews with subject-matter experts at Army schools. This effort produced a series of tests intended to diagnose deficiencies in the P.C.s. Modified versions of these tests will be used in JSEP.

The JSEP program will include a front-end learning strategies module designed to improve soldier skills in reading, studying, test taking, and problem solving. The curriculum will consist of this strategies-training, plus 180 diagnostic review lessons, and 120 skill development lessons, which are being developed for the PLATO and MicroTICCIT computer systems. The program is being tried out at two TRADOC sites and two FORSCOM sites, prior to an Army-wide phased implementation.

JSEP PHASE I REPORT

EXECUTIVE SUMMARY

Requirement:

The solicitation requires that all activities performed during Phase I of the Job Skills Education Program (JSEP) be documented in a Phase I report to the Army Research Institute (ARI).

Procedure:

The Florida State University (FSU) in conjunction with the subcontractor, Hazeltine Corporation, has documented the activities performed in Tasks 2-10 with written reports to ARI. The Task 1 requirement was an in-process review (IPR) presented to ARI on 19 November 1982. This IPR provided a conceptual definition of the development of JSEP.

Findings:

Specific tasks were undertaken by the FSU-Hazeltine team which produced the groundwork and first year's effort in the development of JSEP. Important research and development efforts were completed. Development included:

- o implementation and management plan
- o design specifications including instructional, engineering, and human factors
- o evaluation plan and standards
- o cost benefit trade off analysis
- o a predictive cost and training effectiveness analysis
- o standards and a plan for the civilian academic community to award a high school diploma on completion of JSEP

Research included:

- o a review of existing basic skills curricula
- o a review of the job task analysis and acceptance or rejection of a clustering schema
- o review of successful learning strategies research and applications

Use of Findings:

Phase I's efforts produced the groundwork for the remaining two phases of JSEP and for successful implementation of JSEP throughout the Army.

JSEP PHASE I REPORT

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Operational Problem

It is not new that soldiers must be trained to do their jobs. They must be trained so that each Army job is performed competently--regardless of differences in ability and background in entering soldiers. To accept less would cause many mission elements to fail.

Many Army jobs are increasingly dependent upon the soldier's ability to use high technology and the ability to learn new technology as it develops. Soldiers need more than training. They need enough education to learn subsequent jobs, to become eligible for promotion, and ultimately, to provide leadership for tomorrow's Army.

Research Objective

The goal of the US Army Job Skills Education Program (JSEP) is to design, develop, and test a job-related computer based curriculum for possible Army-wide adoption. The JSEP development project is concerned with four central elements:

1. The computer based curriculum,
2. The soldier management plan,
3. The soldier testing program, and
4. The supporting documents and reports.

The project is divided into three phases. Phase I undertook several tasks which included lesson design, planning documents, and reports that recommend specific courses of action. Many of the action plans spelled out in the Phase I reports will be carried out in Phases II and III; some will be carried out in the years following Phase III.

Phase I contains the following tasks:

Task 1. Develop a conceptual definition for design requirements and specifications.

Task 2. Review existing basic skills curricula.

Task 3. Review job task analysis and select Military Occupational Specialty (MOS) clustering schema.

Task 4. Develop JSEP implementation and management plan.

Task 5. Adapt or develop design specifications including instructional specifications, engineering requirements, and human factors considerations.

Task 6. Develop evaluation standards.

Task 7. Develop JSEP evaluation plan.

Task 8. Develop cost benefit tradeoff analysis.

Task 9. Conduct predictive cost and training effectiveness analysis.

Task 10. Develop standards and a plan for the civilian academic community to award a high school diploma based on completion of JSEP.

Task 11. Phase I Report.

Phase II requires the development of 300 hours of lessons, the soldier management plan, and the preliminary tryout. Phase II includes the following tasks:

Task 12. Select hardware; where appropriate develop software; develop instructor training program and courseware for 300 hours of instruction.

Task 13. Conduct preliminary tryout.

Task 14. Phase II Report.

Phase III provides a continuation of the lesson development begun in Phase II and requires execution of the studies and evaluation plans developed in Phase I. Phase III includes the following tasks:

Task 15. Develop software and courseware for an additional 120 hours of instruction.

Task 16. Conduct JSEP tryout at two US Army Forces Command (FORSCOM) sites and two US Army Training and Doctrine Command (TRADOC) sites.

Task 17. Conduct evaluation and revision.

Task 18. Conduct cost/training effectiveness analysis.

Task 19. Develop technology transfer plan.

Task 20. Document total process in final report.

The purpose of this report (Task 11) is to document all activities performed during Phase I.

Background

During the late 1970s, the Army experienced difficulty in recruiting and retaining qualified personnel. The situation became so acute that many were questioning the effectiveness of the all-volunteer force. Congress expressed concern over the increasing numbers of recruits the Army had been accepting from the lowest mental aptitude level, Armed Forces Qualifying Category IV, since all-volunteer recruiting began in 1972. Individuals in this category have reading and mathematics abilities below the ninth grade level, ranging as low as the fourth grade level. In 1975, the Army enlisted 10% of its nonprior service male members from this category. The rate of category IV recruits increased to 50% by 1980, more than double the 23% category IV youth population in the United States for the same year. At the end of fiscal year (FY) 1981, 45% or over 305,000 of the Army's enlisted population had reading and mathematics abilities below the ninth grade level, ranging as low as the fourth grade level. Congress directed that standards for accession quality be raised, that at least 65% of Army male accessions be high school graduates for the fiscal year (FY) 1983, and that no more than 20% of accessions in any service rank in the category IV.

A FY 1982 Department of Defense Manpower Task Force Report to the President (Weinberger, 1982) indicated a dramatic improvement in recruiting and retention for the FY 1982. The test scores and educational levels of new enlistees compared favorably with civilian youth. However, the report sounded a note of caution and projects that beginning in FY 1985, the Army will probably experience difficulty in recruiting enough accessions who meet the congressional quality standards. The short term picture is rosy but the long term picture is quite clouded. The Army's basic skills problem will be compounded in coming years because of the decreasing availability of 17 through 19 year-old males, depicted in Figure 1. These individuals comprise the majority of the Army's personnel strength. In an era of a shrinking manpower pool, the Army will be hard pressed to maintain the current congressional standards for accession. Additionally, the high technology Army of the future will demand a more highly skilled soldier.

The US Army, therefore, must have a strong commitment to provide soldiers, especially new accessions, the training and education opportunities necessary to succeed in the modern Army. The Army Continuing Education System (ACES) has responsibility for developing and implementing a variety of education programs designed to fulfill this commitment. At a minimum, ACES is expected to accomplish the following four goals with respect to soldiers:

1. increase the likelihood of performing satisfactorily both in training and on the job;

2. increase the capability of functioning effectively in the Army community outside the immediate work setting;

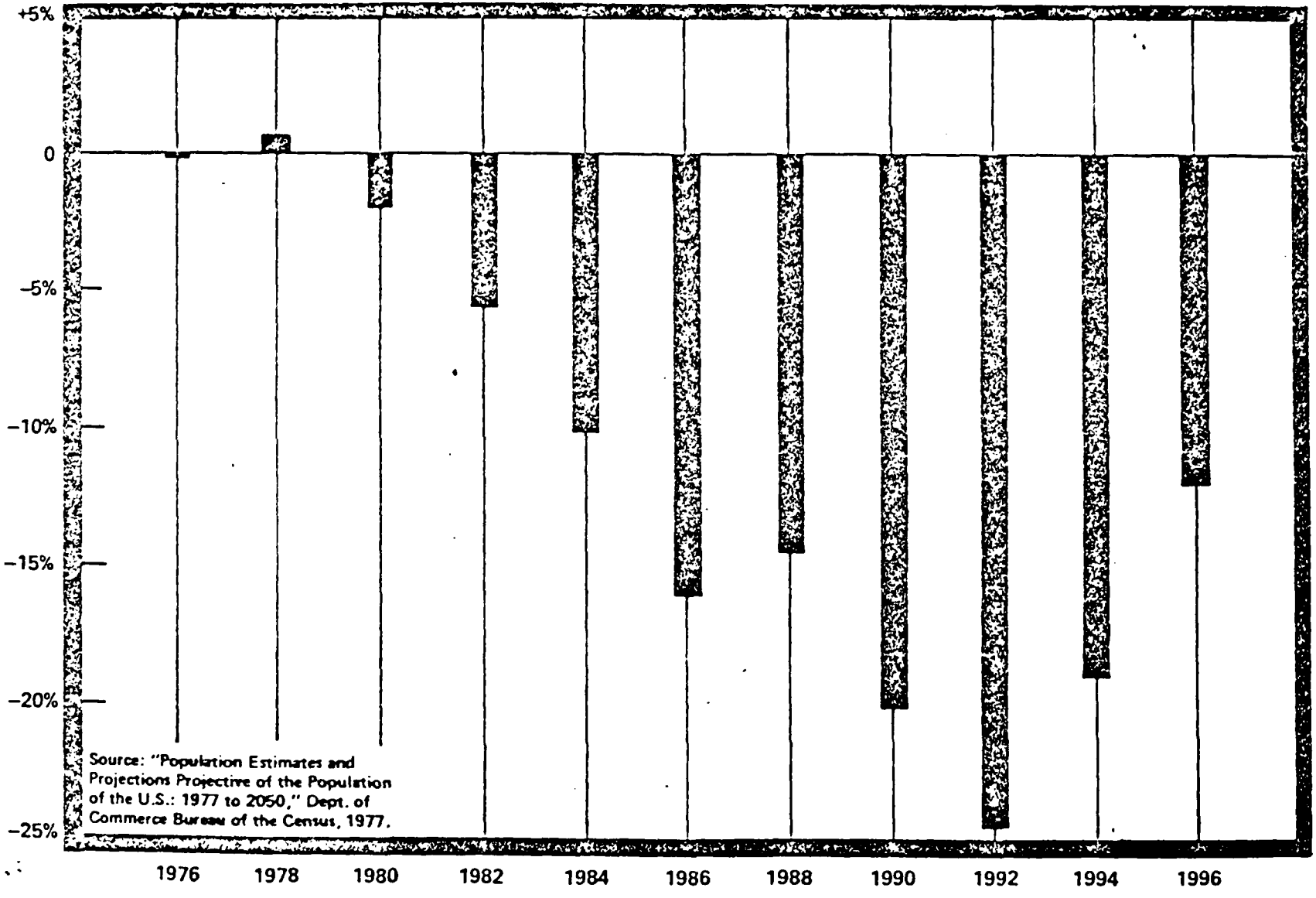

Figure 1. Percentage change in male populations.

3. increase the potential for completing high-quality, off-duty high school, college, vocational-technical, apprenticeship or other educational programs; and

4. increase the potential for pursuing the wide variety of educational programs covered by Veterans Educational Assistance Program or other veterans benefits.

The Education Division, Office of the Deputy Chief of Staff for Personnel (DAPE-MPE) is the proponent for ACES in the Department of the Army. Previous policy decisions have expanded and broadened ACES educational offerings. One part of this effort involves a revision of the Basic Skills Educational Program (BSEP). BSEP focuses on providing enabling skills in language, literacy, computation, and speaking. However, an additional element has been added to the program to address learning strategies needed by service members. The upgrading process is expected to continue over a five year period. The US Army Research Institute (ARI) has the mission to assist in developing and evaluating BSEP.

The shift in the instructional concept of BSEP is toward a more functionally-oriented program. MOS requirements will be used as the basis for determining what the content of BSEP components should be in order to maximize benefits to individuals and to the Army. The emphasis on functionalized curriculum is based on research that shows a higher training payoff when basic skills instruction is tied directly to an area of application rather than focusing on General Educational Development (GED).

The GED approach identifies adult basic skill needs and curriculum content by placing the problem within the context of school subject matter content and progression through levels of complexity within curricula. In contrast, functionally-oriented basic skills may reflect only some of the basic skills defined in the GED approach. Functionally-oriented basic skills education is designed to increase adults' proficiency in performing specific basic skills in the context of job activities rather than general studies. Thus, job-oriented basic skills are more narrowly defined to meet the specific requirements of the job.

One of the first programs to be designed as job-oriented basic skills training was developed for the Army in the early 1970s. It was called the Functional Literacy (FLIT) Program. This program focused on improving job reading skills of soldiers entering the Army with reading test scores at or below the sixth reading grade level. Job reading tasks were identified as situations in which individuals use printed material in connection with performance of a work activity. Functionally-oriented reading education was conducted prior to or concurrent with job training. The FLIT experience, along with recent research (Sticht, 1982) indicates that among marginally literate adults, a brief, concentrated job-related reading program does produce substantial improvement in job-related reading although it may not produce large gains in general literacy.

Currently BSEP II is divided into BSEP which takes place during initial entry training and that which takes place after Advanced Individual Training (AIT). It provides 240 hours of classroom instruction in reading, writing, speaking, listening, and computing for soldiers through grade E1-5.

currently geared to raise literacy skills to at least ninth grade level as measured by the Test of Adult Basic Education (TABE). Soldiers have been identified as being eligible for BSEP II in one or more of the following ways:

- o General Technical (GT) score on the ASVAB below 90
- o commander referral based on supervisor's assessment or voluntary request by the soldier; and
- o Skill Qualifications Test (SQT) score below the minimum required for MOS verification

BSEP II instruction is contracted with accredited educational institutions. The educational institution selects, develops, and provides most instructional material. The Army provides field manuals, technical manuals, and soldier's manuals needed for the program. Class sizes are normally between 10 to 20 students.

JSEP will strengthen and continue this movement toward job-related skills training. The input data for JSEP is the results of an MOS Baseline Skills Analysis Project conducted by RCA Educational Services for the US Army Training and Doctrine Command (TRADOC) (Contract No. DABT60-81-C-0017). The RCA contract encompassed the following work elements: analysis of Initial Entry Training Course Survival Skills (IETCSS), analysis of job tasks for identifying prerequisite competencies, clustering of analysis results, development of diagnostic tests, and development of design specifications and BSEP curricula models. The analysis of IETCSS identified those skills required of (and assumed to be possessed by) soldiers in order to participate in, and graduate from, initial entry training for selected MOS.

PHASE I OVERVIEW

Phase I is composed of 11 tasks that include lesson design and the development of planning documents that recommend specific courses of action. The planning addresses the four central elements of the project:

1. The computer based curriculum
2. The soldier management plan
3. The soldier testing program, and
4. The supporting documents and reports

Computer Based Curriculum

Computer based instruction. In this report, the term computer based instruction (CBI) is used to encompass all known applications of computers to instruction, including computer assisted instruction, computer managed instruction, and other similar terms.

The entire curriculum is intended to provide some 420 hours of CBI, most of which will be computer delivered instruction. The Task 5 Lesson Specifications describes the rationale for deciding which units of instruction would be computer delivered.

At the conclusion of the project, The Florida State University (FSU)-Hazeltine team will deliver to the Army master copies of the 420 hours of courseware.

MOS baseline skills. The data base to be used in designing the curriculum is the TRADOC sponsored MOS baseline skills job task analysis of the 94 most populous MOS in the Army. We received our analysis data from RCA as they became available.

Computer systems. The solicitation required that the PLATO system, a product of Control Data Corporation, be one of the two systems used. The FSU-Hazeltine team proposed the MicroTICCIT system as the second system. All CBI instruction developed will be available on both computer systems. Each system will be configured to meet Army requirements under a variety of conditions throughout FORSCOM and TRADOC, including small remote sites as well as sites having large JSEP populations. The system configurations and a proposed implementation and management plan is detailed in the Task 4 report.

At the conclusion of Phase III, the FSU-Hazeltine team will deliver to the Army 44 MicroTICCIT terminals located at two FORSCOM sites and 40 PLATO terminals located at two TRADOC sites. The courseware intended to be used on these systems will also be made available in the appropriate form.

JSEP tests. The TRADOC-RCA Baseline Skills Analysis Project also included development of tests designed to measure whether soldiers could demonstrate competency on identified prerequisite competencies (PCs) that were derived from job-related tasks. Thus, soldiers in various MOS would require a different mix of instruction, based on their personal test scores and job requirements. To provide a personalized curriculum, we modified the RCA testing program and developed a management plan to identify the instructional requirements of each soldier deficient in the basic skills. The mix of instruction for each soldier, even within the same MOS, could be very different, depending on those test scores.

At the conclusion of the project, the FSU-Hazeltine team will deliver to the Army tests that will provide the information necessary to manage, diagnose, prescribe, and evaluate soldier progress through the JSEP curriculum.

Learning strategies. All soldiers entering the Army have completed many years of instruction in civilian schools. Regardless of how many years of instruction they have had or whether they have graduated from a high school, their functional basic skills competencies show unacceptably wide variations. Because the Army has a demand for job performance at a constant high level of competence, it cannot send to duty those who lack the basic skills necessary to learn and perform their jobs without risking a drop in operational readiness. One approach to remedial instruction is to organize soldiers into classrooms and give them an Army sponsored version of the same instruction they had from kindergarten through high school. The JSEP concept recognizes the shortcomings

of that methodology and has looked to research-based practical approaches to improve results.

One of the more promising lines of research in recent years has been training students how to learn. Although good students always seem to develop personal means of improving their learning habits, poorer students do not. Consequently, in addition to the basic skills instruction, JSEP will offer intensive direct instruction to soldiers on how to learn Army materials. These new learner strategies should improve soldiers' abilities to survive in training environments and to transfer these skills to their jobs.

FSU will deliver to the Army a curriculum in learner strategies that will attempt to train soldiers on how to improve learning skills. This curriculum could be transferred with minimum revision to other Army training programs where soldier learning skills require improvement.

Soldier Management System

Objective. The objective of the JSEP soldier management system is to provide the following key elements:

- An efficient screening test that will compare soldiers' basic skills achievements to the requirements in their assigned MOS and identify discrepancies.
- A JSEP instructional prescription that will provide sufficient training on the MOS required PCs.
- A computer based internal instructional management system that tracks soldiers' progress and guides them through the instruction.
- A computer based JSEP management system that tracks the progress of all soldiers in any location and provides essential management reports as required.

Approach. Because there are large differences in the functional basic skills requirements among the selected MOS and because soldiers vary considerably in their achievements when they come to the Army, it is necessary to design a course of study for each eligible soldier based on MOS requirements and soldier achievement. It was further decided to adopt a structured systems analysis approach that requires a "top-down" perspective. Realizing that there are soldiers who need very little JSEP instruction to become fully capable of learning all the requirements in their MOS, the first tier of instruction will be designed to achieve breadth of MOS coverage.

Subsequently, more in-depth coverage will be developed for those MOS having the largest candidate JSEP populations. The second tier of instruction is intended to offer more thorough instruction to those high priority MOS with the greatest requirements. The design goal is to provide that optimal instruction required to make soldiers fully capable of learning their skill level 1 and 2 tasks.

JSEP Soldier Testing Program

It is extremely difficult to assign soldiers to instructional programs efficiently without knowing exactly what they know when they arrive. Accordingly, a systematic testing program was designed to provide all necessary information for assignment.

Testing procedure. During their first duty assignment soldiers are declared candidates for the instruction provided in JSEP based on a general test battery. Identified soldiers are given selected Diagnostic Tests to identify deficiencies that if corrected would enable them to learn skill level 1 and 2 tasks in their MOS.

Based on their performance on the Diagnostic Test, soldiers are given a recommended series of lessons selected to improve their job-related basic skills competencies. Each lesson ends with a posttest designed to insure that the soldiers have mastered lesson objectives. When they have completed all required lessons, a summary posttest made up from test items on the lesson posttests is given to ensure that they have retained what they learned. When they pass the summary posttest, they are said to have successfully completed JSEP.

All test data are entered into the JSEP soldier management system to facilitate soldier scheduling and generation of specified reports.

Supporting Documents and Reports

FSU developed a full range of reports to provide documentation of JSEP Phase I activities. Reports are described below on a task by task basis.

Task 1: Develop a conceptual definition for design requirements and specifications. This conceptual definition was presented at an in-process review (IPR) on 19 November 1982 at ARI. The Army need, reflected in this contract effort, is to provide functional basic skills instruction on job-related prerequisites so that soldiers in each of the 94 selected MOS Army-wide would be able to learn their skill level 1 and 2 jobs more efficiently.

Task 2: Review existing basic skills curricula. The Task 2 report provided a summary of all related existing materials thought to be potentially useful in the JSEP curriculum.

Task 3: Review job/task analysis and select MOS clustering schema. The Task 3 report addresses the analysis and evaluation of the products of the RCA-TRADOC MOS Baseline Skills Analysis Project.

Task 4: Develop JSEP implementation and management plan. The Task 4 report addresses three important elements of the total JSEP program:

1. The JSEP soldier management system,

2. The implementation plan, and

3. The logistics and maintenance system.

Task 5: Adapt or develop design specifications, including instructional specifications, engineering requirements, and human factors considerations. The Task 5 report addresses the design of the lesson specifications which will result in approximately 420 hours of instruction. These lesson specifications are described and examples from several lessons are used to illustrate various issues. The lesson specification documents (which are working documents and collectively fill thirty-three 1 1/2" size three ring binders) are not included in the Task 5 report be ause of sheer bulk. A listing of the lessons designed and media selection decisions are contained in the report. The engineering specifications describe the functional requirements that must be met in the design of the planned CBI systems. Human factors considerations for the selected systems are also described.

Task 6: Develop evaluation standards. The Task 6 report presents standards for evaluating the JSEP design and development effort under the current contract. A preliminary tryout will be conducted during Phase II. A full evaluation of the project is to be undertaken in Phase III. This report describes the standards that will provide the basis for those evaluations.

Task 7: Develop JSEP evaluation plan. The Task 7 report details the evaluation procedures to be followed during the preliminary tryout to be conducted in Phase II and for the full scale tryout, to be conducted during Phase III at two FORSCOM and two TRADOC sites. A rationale for the evaluation plan is presented, the objectives and procedures stated, and the size and scope of the soldier populations are described.

Task 8: Develop cost benefit trade off analysis. The Task 8 report deals effectively with the "what is" for the equipment systems specified. Predictions about what "will be" during the period of Army-wide implementation of JSEP are necessarily less accurate, due to rapidly changing technology and costs. Projections are not part of Task 8.

Task 9: Conduct predictive cost and training effectiveness analysis. The Task 9 report presents the FSU-Hazeltine approach to the cost benefits of JSEP. Through visits to Army education centers and analysis of the costs of development, it was possible to identify those costs that are likely to have the most impact in the overall cost model. Resources are concentrated on measuring those costs that would be both controllable and major contributors to the total cost of ownership.

The life-cycle systems management model is taken into account as plans are set forth in this report to conduct the cost training effectiveness analysis in Task-18.

Task 10: Develop standards and a plan for the civilian academic community to award a high school diploma based on completion of JSEP. The Task 10 report presents the approach recommended by FSU-Hazeltine in which work completed in JSEP is credited toward the award of a competency-based adult education diploma. The combination of on-duty job oriented basic skills instruction (JSEP) and off-duty general education represent an educational experience that we believe diploma-granting institutions will accept for a diploma.

Task 11: Phase I report. The Task 11 report presents an integrated synopsis detailing all of the efforts undertaken in Phase I.

PHASE 1 TASKS

Task 1

Task 1: Develop a conceptual definition for design requirements and specifications.

Requirement. The solicitation requires a conceptual definition to insure the contractor and the Contracting Officer's Representatives (COR) are in agreement with the aspects underlying development of the JSEP system. This agreement is essential to successful execution of the contract. The product of Task 1 is specified as the conceptual definition of the design requirements and specifications to be delivered at an IPR at ARI. This IPR presents a summary of the issues and concepts that the contractor will consider when designing the functional specifications. Issues to be covered as part of this briefing shall include (but are not necessarily limited to) instructional, engineering, human factors, and courseware issues, in addition to cost tradeoffs.

Conceptual Definition. Perhaps the best way to begin is to present our concept of what the Army will have at the conclusion of the three phases of this project followed by a discussion of the effort required to produce that contract product. We will estimate what we believe the Army will have to do to realize the benefits of the project. While each of these points will be detailed more completely in each separate task report, a summary and overview here will aid understanding of the project.

There are four central elements of the project that will result in specific contract products:

1. computer based curriculum,
2. soldier management plan,
3. soldier testing program, and
4. supporting documents and reports.

The four elements are distributed across three phases. Phase I is mainly devoted to lesson design and developing planning documents that recommend specific courses of action. Many of the action plans spelled out in the Phase I reports will be carried out in Phases II and III. Some of the documents require actions that will be carried out in the years following Phase III.

Phase II requires the development of 300 hours of lessons comprising the curriculum and the JSEP soldier management plan. The preliminary tryout and the principal effort on the testing program will also be in Phase II.

Phase III provides a continuation of the lesson development begun in Phase II, and requires carrying out the studies and evaluation plans developed in Phase I.

Task 1 was completed at an IPR on 19 November 1982 at ARI (see Phase I In Process Reviews, below).

Task 2

Task 2: Review existing basic skills curricula.

Requirement. The solicitation requires a review of representative samples of materials from off-the-shelf curricula, and materials from locally developed BSEP curricula, to determine their suitability for use in JSEP.

The product of Task 2 is specified to be a listing of recommended materials, along with justification for their inclusion and explanation of how they will be used, to be delivered to the Contracting Officer's Representative (COR) at an IPR.

Procedure. There were three criteria used as guidelines in the review of the materials. The primary consideration during Task 2 was to decide whether the existing materials matched the target population's characteristics. A secondary consideration was whether the materials meet the objectives selected for inclusion in the total JSEP program. Thirdly, consideration was given as to whether or not existing materials could be adapted or revised to bring them more in line with the objectives selected for JSEP.

The major objectives accomplished were: (1) the acquisition of basic skills materials, (2) evaluation of the materials obtained to decide whether the content, format, and instructional components matched the RCA taxonomy, and (3) development of a summary chart by prerequisite competency number for use in JSEP.

Findings. We found that the task encompassed the following activities:

1. Materials were obtained by the project staff during visits to military installations, Adult Basic Education (ABE) centers, and Elementary and Secondary Education Act Chapter 1 Programs (Public Law 97-35). All programs contributed materials.

2. Other services and military contractors supplied samples of their basic skills materials currently being used.

3. Evaluations were made of all the materials obtained.

4. A summary chart of the materials by PC as specified in the RCA taxonomy was devised. This chart lists all the PCs and the available materials for each. It includes a rating of those materials.

Use of findings. The result of this effort is a report containing the materials useful to the JSEP curriculum. Included in the report is a brief summary of the scientific services program review of basic skills material completed by Dr. Walter Dick at FSU and Dr. Kent Gustafson at the University of Georgia. Dr. Walter Wager of FSU reviewed the PLATO Basic Skills Materials under separate contract with TRADOC.

Also included in the report are some general comments about the evaluation of basic skills materials, including a discussion of areas that should be

considered when making revisions, and suggestions on how the materials could be used in the JSEP program. This report was submitted to ARI in lieu of the required IPR.

Task 3

Task 3: Review job task analysis and select MOS clustering schema.

Requirement. The solicitation requires a review of the job task analysis and clustering schema developed by RCA to determine their suitability for JSEP. Subject to agreement by the COR, contractor has the option of adopting or modifying the MOS clustering schema. The product of Task 3 is specified to be a viable plan for clustering MOS baseline skills.

Procedure. FSU conducted a thorough and detailed review of the RCA's job task analysis. Except for minor changes, we found the work by RCA to be useful and helpful; consequently, we accepted and incorporated the results of the job analysis and elements of their taxonomy into the lesson design.

We analyzed the two clustering approaches suggested by RCA. These approaches were (1) clustering by MOS as called for in the solicitation, and, (2) clustering by PC. To make an informed and rational choice, we studied RCA's clustering report and curriculum model, and then tried several alternative clustering methods.

Our analysis of RCA's proposed curriculum model focused on two main points:

- The Army's use of the model for implementation and management of the curriculum
- FSU's use in lesson development

Findings. We found the MOS Baseline Skills Analysis Project conducted by RCA to be a thorough and useful analysis of the tasks performed by level 1 and 2 soldiers in the 94 MOS. We agreed with RCA's conclusions that clustering does not provide guidance for curriculum development. Based on our understanding of the requirement, our analysis of the RCA reports, and our own clustering efforts, we can find no evidence that there is an underlying structure in the raw data that can be discovered through clustering.

RCA presented a complete, sequenced, and interdependent curriculum model. Our analysis of the data presented in the reports available to us, however, has not revealed any empirical support for that model.

Use of findings. The review of RCA's job task analysis facilitated our design effort. The specific products used were:

- Complete Extended Task Analysis Procedure Results for each MOS
- Prerequisite Competencies (PCs) for each MOS

- c Complete Prerequisite Competency Indicator Statement for each PC (Volumes of all statements in RCA Job Analysis of MOS which relate to a PC.)

- o MOS-PC Matrix

Based on our analysis of all RCA contract products and our understanding of the Army requirement, we have recommended that the clustering approach be abandoned in favor of a JSEP soldier management model that accommodates individual soldiers. The model uses test scores to establish a soldier's curriculum, then sequences the instruction based on soldier progress and performance on the lessons. We believe that this approach is totally consistent with the capabilities of JSEP and the general requirements in the solicitation.

Task 4

Task 4: Develop JSEP implementation and management plan.

Requirement. The solicitation requires that the contractor design an implementation and management plan to attain maximum efficiency in use of resources, personnel, and facilities support. Space requirements and operational procedures, including operations and maintenance personnel, should be specified. Record keeping and reporting techniques, including documentation of individual progress, shall be consistent and compatible with existing Army information systems. The plan should include procedures for revising the implementation and management plan. Equipment, maintenance, spare parts, and logistics requirements must be specified. The contractor shall also address issues related to interfacing with an automated system to support transcript requests, which is under development by the Education Division, ODCSPER.

Procedure. The FSU-Hazeltine team sought to provide an initial estimate of the hardware, maintenance, logistics support, and operations requirements for the computer systems to be deployed. The operation of JSEP in the education centers was conceptualized, including the soldier flow, the recommended decision points, and the interfaces among the various elements of the program necessary to accommodate computer based instruction.

Findings. The JSEP management plan is intended to be used to manage soldier flow through an education center and through JSEP. Many administrative and procedural considerations in the soldier flow must be verified before detailing the complete management plan for each of the major system elements. The proposed JSEP soldier flow and decision model is shown in Figure 2.

As shown in the upper left hand corner of the flow chart (Figure 2), soldiers enter the education centers for a variety of reasons. Reasons and procedures vary from one Army post to another. Normally, a counselor will refer a soldier to take the Locator Test if the soldier has not already taken it. Once the Locator Test has been taken, the verbal and math scores will be sent to the commanding officer (CO) along with a list of PCs in which the soldier is likely to be deficient, and a list of MOS related task indicator statements that the soldier is predicted to encounter difficulty in mastering.

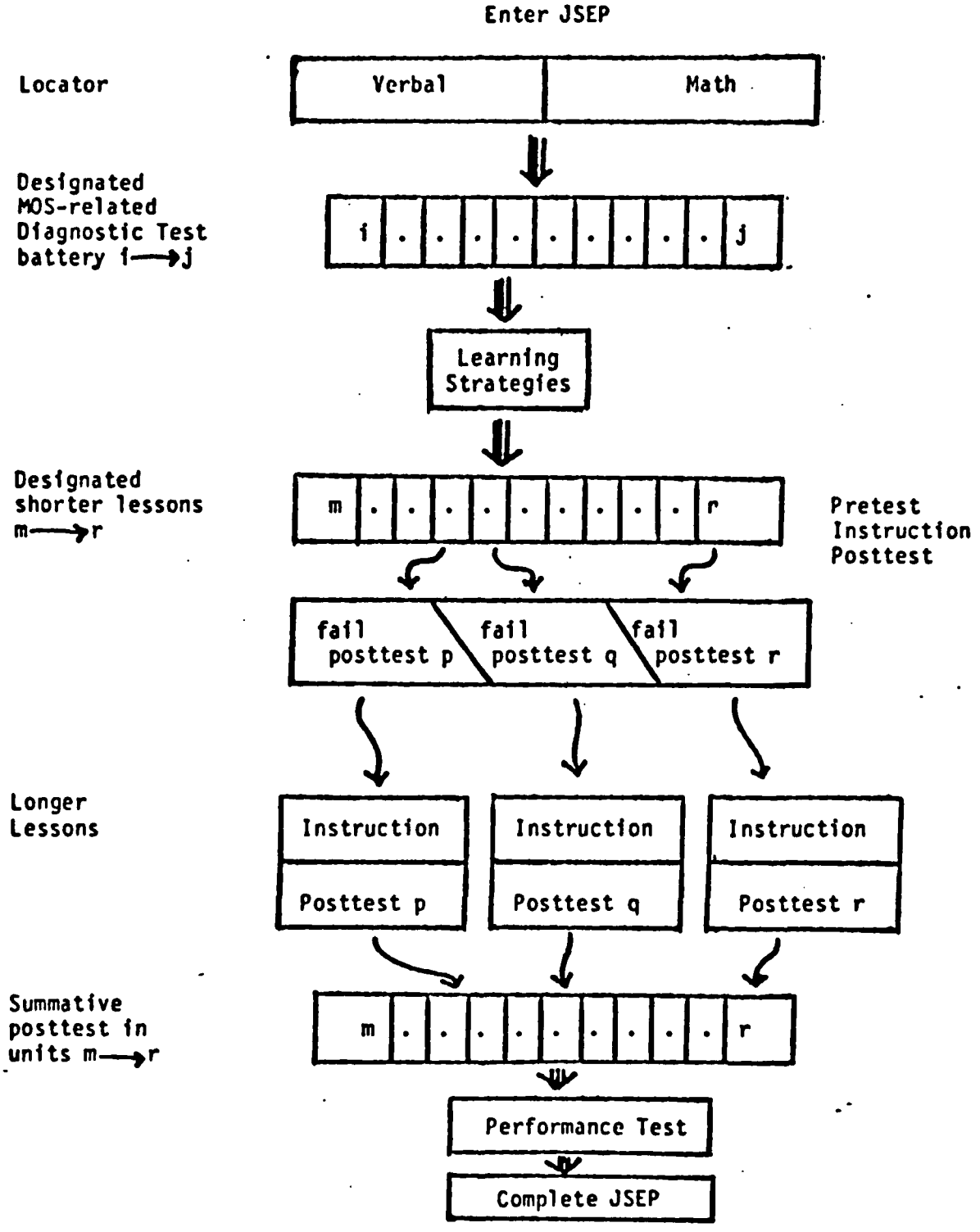

Figure 2. JSEP testing and learning of prerequisite competencies.

On the basis of such information, the CO will decide whether to send the soldier for further diagnostic testing.

The Diagnostic Test will be administered in an adaptive testing form to prevent the possibility of a soldier being assigned excessive numbers of test items in the case of extremely low Locator Test scores. Adaptive testing is designed to "tailor a test" to the performance level of the soldier, thereby eliminating the need for all soldiers to see all test items. The absence of an adaptive test could, therefore, lead to administration of more items than are necessary.

Upon the completion of the diagnostic testing procedure, recommendations for the array of lessons the soldiers will be assigned and an estimated length of time to complete the lessons are reported to a decision authority, most likely the soldiers' commanding officers. If commanding officers release the soldiers for JSEP, they then report to the education centers for the JSEP orientation program and the instruction.

The JSEP curriculum consists of the following components:

1. Orientation to the purpose of JSEP, its structure, operating procedures, and instruction on how to operate the computer.

2. JSEP Locator Test.

3. JSEP Diagnostic Test.

4. Learning strategies lesson with embedded components in the longer lessons.

5. Shorter lessons which include three elements for all PCs: (1) a pretest, (2) instruction pertaining to essential rules, operations, and concepts; practice exercises and content to stimulate recall of prior PC learning, and, (3) the lesson posttest.

6. Longer more detailed lessons on selected PCs of high priority with posttests.

7. Summative posttests which are criterion-referenced "final examinations" covering all instruction received by each soldier.

8. Performance-like test consisting of a CLOZE reading test on an appropriate Soldier's Manual.

JSEP Process. The process through the system can be expressed in terms of its basic configuration (see Figure 2):

1. Soldiers take the JSEP Locator Test and depending on their MOS, low math, and verbal scorers are routed to a tailored Diagnostic battery.

2. On the basis of Diagnostic test scores, soldiers are routed to the short lesson pretest for selected PCs. The lesson pretest consists of 3 items. If soldiers miss any of these items they are routed directly into the short lesson.

3. If all three pretest items are answered correctly, they take the lesson posttest. If the soldiers pass the posttest, they go on to the next PC.

4. If they fail the posttest after the short lesson, they are then routed into a longer lesson that also contains a complete posttest.

5. If soldiers fail the posttest after the longer lesson, they will then be identified to the instructor for an alternative form of instruction.

6. After the soldiers have completed all of their assigned lessons by passing all the posttests, they take a summative posttest (comprehensive examination) consisting of perhaps 30-45 items drawn from the pool of items on assigned lesson posttests.

7. If they pass the comprehensive examination, they are then ready to take the JSEP performance test which is composed of job specific test items.

8. If soldiers fail the summative posttest, they may be given remedial instruction, which may consist of re-routing through short or long lessons, small group or individual tutorials, or lower level self-instructional materials from other sources.

9. After completing the remedial instruction, soldiers retake a new form of the posttest. Each soldier will have 3 opportunities to pass the comprehensive examination.

10. Performance testing will also be included during the full scale tryout to ascertain whether JSEP learning gains are transferred to job specific test items.

11. Final decision on appropriate performance testing will be made during Phase III.

Findings. At this point in the development of JSEP, the Task 4 report will be far more heuristic than prescriptive since there are many unanswered policy and operations questions. And perhaps just as important, the final configuration of the equipment system has not yet been approved. The major purpose of presenting the present report before these issues have been resolved is to permit reasonable and responsible budget planning.

We anticipate the implementation and management plan will go through several revisions, the first of which occurred in Phase I. In Phase III, the continuation of the implementation and management plan occurs in Task 19, the Technology Transfer Plan.

Task 5

Task 5: Adapt or adopt design specifications, including instructional specifications, engineering requirements, and human factors considerations.

Requirement. The solicitation requires that we adapt or adopt design specifications, including instructional specifications, engineering requirements, and human factors considerations. To do that, we used, in part, the specified products from the TRADOC sponsored contract with RCA. A complete list of these contract products is presented in Appendix A of the Task 5 report.

Procedure. The first step following contract award was planning the approach to the Job Skills Education Program (JSEP) design. Dr. Laverne Cook, the RCA Principal Investigator on the MOS Baseline Skills Analysis Project, participated in a Florida State University (FSU) sponsored meeting of all principal project agencies to describe the RCA work. Subsequently, a team from Army Research Institute (ARI) and FSU visited RCA for a thorough two-day briefing on the details of each of the RCA contract products. Following this meeting, a plan evolved to integrate available RCA results and contract products into the JSEP design.

During the Task 1 in-process review, the project schedule was revised to accommodate the delayed delivery of RCA products. While it was possible to accommodate the initial delays in receiving RCA deliverables, subsequent delays required extensive project redesign. FSU began work on the lesson specifications and assigned the work for engineering and human factors to Hazeltine Corporation.

To insure prompt receipt of the RCA contract products, we issued a purchase order to RCA for duplication and mailing of each of their required analyses and reports. It was our initial plan to use RCA products to the fullest extent possible so that we could concentrate our resources on those aspects of JSEP unique to our contract.

Findings. Based on the RCA Taxonomy, the initial FSU lesson specifications were developed on a selected sample of lessons thought to be representative of the total lesson population.

Some lessons, thought to be fairly typical, were carried through the lesson development procedure called for in the lesson specification. In order to model in a small way the procedure planned for the entire program, two lessons went through all the design, development, and evaluation stages. These lessons were then field tested on an installed TICCIT system at the Marine Corps Communications Electronics School, Twentynine Palms, California. Based on the results of this field test, the remainder of the 180 lesson specifications were developed according to a revised procedure.

In addition to the specific instruction designed for each of the initial RCA Prerequisite Competencies (PCs), general instruction on learner strategies was planned to permeate the entire curriculum. These learner strategies are intended to encourage and support JSEP soldiers in learning and managing their

study.

A draft of the lesson specification was designed and refined, and a working version was developed. Prototype lessons were written to evaluate the entire development stage. The knowledge gained from testing the prototypes led to the development of an approved lesson specification format.

Lesson specifications for 180 PCs were developed. A prerequisite competency was defined by RCA to mean a generic basic skill that soldiers must have in order to learn specific tasks on their skill level 1 and 2 jobs. These PCs were directly related to job task performance.

Each lesson specification was reviewed by an experienced Army Non-commissioned officer and reserve officer at FSU to increase the Army relatedness of the lesson specifications prior to being submitted to ARI. Each test item received from RCA was reviewed by experienced test developers to insure that it was consistent with the PC, as these PCs were interpreted by FSU. Indicator statements are RCA contract products which illustrate precisely how each of the PCs is used in each of the 94 MOS analyzed. It is these indicator statements that truly reflect the job-relatedness of the PC and are the basis for the instruction designed to teach it.

A thorough analysis of all engineering requirements was made for the microcomputer system being employed during the development effort. Further discussion of the equipment and maintenance requirements for the entire implementation of JSEP are contained in the Task 4 Report, The Implementation and Management Plan.

Human factors considerations for each of the prescribed systems were analyzed.

Use of findings. The entire effort of Task 5 produced two products: the lesson specifications for the 180 PCs, and useful analyses of all engineering and human factors considerations. The lesson specifications will provide the framework for the development of the short and long lessons. The information gained from the engineering and human factors considerations will aid in the development of the implementation and management plan.

Task 6

Task 6: Develop evaluation standards.

Requirement. The solicitation requires three kinds of evaluation standards.

- Evaluation standards to determine if the system meets the stated specifications for courseware, software and hardware.
- Specific formative evaluation standards to determine if the system is effective as a functional JSEP.
- Job-related evaluation standards, such as summative evaluation, to determine if the system is effective in improving performance on the job.

The product of Task 6 is a detailed report describing the evaluation standards. Approved evaluation standards will be used in the evaluation plan.

Procedure. The strategy for developing JSEP evaluation standards was first to articulate goals, objectives, and process steps to describe the intents of the project. The objectives and process steps were then reviewed by the FSU-Hazeltine JSEP executive committee and revised accordingly. Following these procedures, an outline of performance standards was initially developed and these were again reviewed by members of the FSU-Hazeltine JSEP executive committee.

The performance standards are, in the main, stated in the form of either process criteria or in the form of products which contain certain kinds of information or analyses. For example, at this time we prefer to state that we will analyze and report the pass rate of troops at a field test site while controlling for a variety of possible intervening variables, rather than to predict a certain outcome. We believe that process standards must be used during the design and development phases in order to preserve the decision freedom until empirical data are available from the tryouts. The setting of desirable outcome standards will be possible later when the relationship between input variables and outcomes become better known. Only at such a time can we set a standard to address the "How-much-development-is-enough" issue.

Findings. The following eleven objectives were identified:

1. Establish project review, control, and decision-making procedures.

2. Conduct a review of literature and instructional materials related to JSEP purpose.

3. Design a job-related, computer based prerequisite competency curriculum (JSEP).

4. Design an instructional support system to field test the JSEP curriculum.

5. Design a management information system to direct, monitor, and report student progress in JSEP.

6. Develop a job-related, computer based prerequisite competency curriculum.

7. Field test a job-related, computer based prerequisite competency curriculum.

8. Compare alternative computer based delivery systems in terms of effectiveness, efficiency, and benefit to US Army mission.

9. Evaluate the potential impact of JSEP on Army job skills, educational programs, and soldier career goals.

10. Explore the feasibility of using JSEP for the awarding of high school credits and credentials.

11. Prepare specifications for the dissemination of JSEP Army-wide.

The process steps to accomplish each objective were identified and performance standards for each step were listed. If there is a single overarching evaluation standard, it is the degree to which JSEP, as systematically produced curriculum can effectively eliminate PC deficiencies.

Use of findings. On the basis of the review of these proposed evaluation standards by ARI, and their subsequent refinement, the evaluation plan (Task 7) will be developed to specify the methods of inquiry, the measures to be used, the population sample, the proposed analyses. Until that final refinement the important question is, what should be observed about the program that will be the most revealing for what kinds of audiences.

Task 7

Task 7: Develop JSEP evaluation plan.

Requirement. The solicitation requires the development of the Job Skills Education Program (JSEP) evaluation plan. This plan should set out procedures to establish whether any improvements on developed criterion measures were attributable to JSEP. The contractor shall develop data collection instruments and a data collection scheme which will reflect evaluation issues as well as quality control and revision.

Procedure. Preliminary drafts of the evaluation plan were developed by The Florida State University JSEP staff and underwent review by the Hazeltine internal review committee, the Army Research Institute, and the American Institutes for Research. Additionally, ARI, FSU, and Hazeltine personnel reviewed elements of the evaluation plan pertaining to the preliminary tryout scheduled at Fort Rucker. Revisions were made to the plan according to their suggestions.

It is planned that additional refinements in the plan will be made as it moves from concept to operation.

Findings. The evaluation objectives, procedures, and data collection instruments constitute the findings of this task. The evaluation plan is divided into two major parts: the evaluation of the preliminary tryout of JSEP at Fort Rucker in 1984, and the full scale tryout of JSEP at two TRADOC and two FORSCOM sites in 1985.

Use of findings. The evaluation plan will be implemented during the preliminary and full scale tryouts. The data will provide the information required to assess the effectiveness of the JSEP system.

Task 8

Task 8: Develop cost benefit tradeoff analysis.

Requirement. To develop a list of options available with computer based instruction (CBI), their advantages and limitations with respect to JSEP, and their costs for varying numbers of units or systems.

Procedure. The contractor conducted a review of the literature relevant to CBI and consulted with educators, psychologists, instructional systems designers, and computer scientists in academia and private industry.

Findings. The options applicable to JSEP are whether to incorporate an audio or video capability into the instruction, whether to make hard copy (printer/plotter) available, whether to use color, and some environmental considerations of the classroom.

There are certain features (adequate screen resolution and partitioning and comparable graphics, text, and student response facilities) on the systems studied that were also evaluated in terms of JSEP instruction.

The advantages and limitations of the options and features are discussed and, where applicable, cost estimates are provided. This report will enable U.S. Army decision-makers to determine the configuration of JSEP.

Utilization of Findings. The cost data will be used in models of possible configurations to compare costs of various systems.

Task 9

Task 9: Conduct predictive cost and training effectiveness analysis.

Requirement. The solicitation requires the development of a predictive Cost and Training Effectiveness Analysis (CTEA) model specifically for JSEP.

Procedure. The contractor conducted a review of existing CTEA models devised for military settings. Areas for discussion included:

- o the classification system
- o predicting cost of training configuration
- o the costing process
- o estimation of training effectiveness
- o comparison of alternative training programs

Findings. Based on the review of existing CTEA models, and the wide range of features in JSEP, we developed a model to accommodate JSEP's unique requirements. The features to be addressed and their bases include:

- o the self-paced nature of JSEP rendered assumptions underlying some existing CTEA models inappropriate.
- o the open entry, open access characteristics of the program requires "open system" methods as opposed to "closed system."
- o the need to synthesize CTEA models into one which addressed JSEP characteristics.

Because of the need for data not now available, we plan to conduct the predictive CTEA after the Phase II Tryout. The effort to date has produced a CTEA model that will address the unique applications problems identified during the analysis and model development.

Task 10

Task 10: Develop standards and a plan for the civilian academic community to award a high school diploma based on completion of JSEP.

Requirement. The solicitation requires the development of standards and a plan for the civilian academic community to award a high school diploma based on completion of JSEP.

Procedures. The FSU response called for the team to confer with state officials, identify state high school credentials requirements, review existing US Army high school diploma programs, analyze JSEP materials, confer with regional accreditation officials, and maintain communication with appropriate US Army officials.

The team has complied with all of the prescribed actions above including visits to Forts Bliss, Carson, Lewis, Monroe, Riley, Campbell, Bragg, Polk, Rucker, and McPherson as well as the sponsors of the program. Visits have also been carried out to selected school districts, and state departments of education, and to Middle States and Southern Associations of Colleges and Schools' Commissions on Higher Education.

The purpose of the Task 10 report is to identify considerations or issues to be answered before the Task 10 plan can be implemented during Task 19 in Phase III. Following the identification of issues, a list of concerns will be given. Then, a plan will be provided in order to comply with the product delivery requirements.

During the third year of the Contract, the FSU team will formulate the Basic Skills Profile that will then be circulated to federal, regional, state, and local education officials directly or indirectly associated with the Army installations and the twenty-two (22) states identified as having the highest military populations. In order to get credit for JSEP work, the procedure to be followed for soldiers in each of these states will be:

1. Complete the JSEP Locator Test.

2. Receive results which include identification of (a) deficiencies related to MOS against which the JSEP diagnostic test would be administered, and (b) the non-MOS related deficiencies which would become the basis for the Education Services Officer to prescribe off-duty study.

3. The student would follow the learning strategies of JSEP as outlined in the Implementation and Management Plan.

4. Upon completion of the JSEP process and demonstration of competencies

for MOS related areas, covered during duty hours (and satisfactory completion of off-duty work), certification would be made by the Education Services Officer for recognition at the school district or State Department of Education level.

5. School district or state awarded high school diploma will be awarded on the basis of the Basic Skills Profile or state prescribed competency test associated with step 4 above.

Findings. We have found that transfer of credit between accredited postsecondary institutions may not be the same as acceptance and credit recognition between secondary (high schools) and postsecondary institutions. Therefore, it is important to distinguish between a Competency-Based Adult Education (CBAE) high school credential, a high school vocational education credential, or an academic high school credential.

CBAE programs offered by state certified or accredited high schools have as their purpose and focus adult educational literacy. All of the twenty-two (22) states identified in Task 10 report that establishing the actual requirements for the CBAE high school credential is the authority of each local school district. The desired outcome, however, is demonstrated competency in the basic skills. Telephone interviews with the officials at the twenty-two (22) states revealed a strong consensus that the grade level proficiency of CBAE high school graduates approximates eighth grade level. Therefore, the literacy skill achievement level of JSEP should meet or exceed that of the typical school district CBAE high school graduate.

Those two-year and four-year postsecondary institutions having an open-door admissions policy will find the CBAE high school diploma acceptable for admissions whether it is a local school district program or the JSEP related credential. Selective admissions postsecondary institutions will not honor the CBAE diploma for admissions purposes.

Some states have unique diploma requirements. The diploma unique courses range from such courses as "Texas History" in Texas to a course on "Communism and Americanism" in Florida, where the military training itself is acceptable to Florida to meet that course requirement.

Present policies of the US Army make it possible for each installation to provide an opportunity to a soldier to receive a high school diploma through the combined on-duty and off-duty studies program. The high school diploma programs are offered through a contract with a secondary or post-secondary institution and this policy will be as viable and appropriate with JSEP as it has been to date.

The specific requirements of each state are presently being accommodated through the obligation of the contracting high school program institution at each post to have state authorization for the high school credential.

Additional content will be necessary through off-duty work if the goal is blanket award of high school diplomas for all personnel completing the JSEP programs. It is apparent that great variation in the high school diploma programs now exists. At Fort Bliss, the program is truly a CBAE program and therefore consistent with JSEP.

At Fort Carson, the actual program is an academic high school curriculum. In that case, present Army personnel as well as those in the future would find it obligatory to complete the required Carnegie units of academic subject matter regardless of completing the JSEP or their scores on the Test of Adult Basic Education (TABE).

At Fort Lewis, the contract is with a postsecondary institution that also has authority to award the high school diploma. An analysis of their program of studies reveals a general education curriculum and officials of that contracting agency indicated credit would be given for completion of JSEP.

Use of findings. There are important assumptions basic to the proposed plan. The first is that the present Army educational services policies will continue whereby a contract for off-duty course work will be made with an institution awarding a high school diploma.

With few exceptions, the state officials interviewed saw the JSEP program as offering an identifiable basic skills program that could be used as a model or prototype for CBAE diploma programs.

The Locator Test has been designed to identify mastery and deficiencies of verbal and quantitative competencies. Since the instrument must deal with the total spectrum of military occupations, it is comprehensive. Therefore, a person taking the Locator Test will have demonstrated verbal and quantitative mastery or deficiency for a broad range of military occupations. The on-duty participation in JSEP will be limited to the MOS of that individual. Any remaining deficiencies will need to be considered as part of the off-duty requirements of that individual for meeting the high school diploma requirement.

We believe that this plan will result in the beginning of a dialogue between representatives of the Army and local officials to adjust the needs of the program to the realistic possibilities in each of the states. When the draft curriculum is ready, it can be circulated in suitable form to appropriate state agencies. This mechanism will begin the dialogue.

Nothing in our conversations with any of the state officials indicated that they were opposed to or were unwilling to consider the approach we outlined to them.

PHASE I IN PROCESS REVIEWS

Two IPRs were held during Phase I.

IPR 1

The first IPR was held on November 19, 1982, at ARI. This IPR was required as the product of Task 1. The purpose was to present a summary of issues and concepts that the FSU-Hazeltine team would consider in designing the project.

The principal investigator briefed the COR and other Army unit representatives on the FSU concept of what the Army will have at the conclusion of the three phases of the project. Appendix A is a booklet containing photocopies of the transparencies used in the briefing. The discussions that followed the briefing helped clarify various points and assisted the FSU-Hazeltine team in understanding precisely what was expected under the contract.

IPR 2

The second IPR was held on April 28, 1983. This IPR was a combination of the Task 5 IPR and the Phase I IPR. The purpose was to insure that FSU and the government were in agreement on the planned functional specifications and to summarize accomplishments of Phase I.

Dr. Harry O'Neil gave a brief history of BSEP. Dr. Beatrice Farr (COR) described excerpts from the results from needs assessment performed by the American Institutes for Research (AIR). Dr. Branson (Principal Investigator) reported on the progress of the Phase I effort, identified issues requiring clarification and guidance, and recommended proceeding with Phase II. Dr. Laverne Cook described the RCA effort and the new schedule for deliverables.

A number of key issues regarding development and evaluation were raised by Gary Beanblossom, Ed Neff, and Les Orech of Education Division, ODCSPER. Key among these issues were:

1. When soldiers should be referred for JSEP and by whom.

2. How we will know the degree to which JSEP is effective in improving job performance.

3. How to make the program serve an Army-wide audience.

It was agreed that AIR would design an evaluation study that would establish the contribution of JSEP to job performance on the first duty assignment. Another major issue centered around the question of how to provide or supply copies of existing off-the-shelf materials. It these are to be a part of the specified JSEP curriculum, they should either be available or should be put "on line" in the computer to assure a future supply to users.

It appeared to be the consensus of the group that Phase I was proceeding according to plan and that no significant issues with regard to performance on Phase I remained unanswered.

CONCLUSIONS FROM PHASE I

FSU and Hazeltine Corporation have provided ARI and associated agencies with all contract deliverables required in Phase I of JSEP. Phase I of JSEP has produced the groundwork for the remaining two phases, and for the successful implementation of the JSEP program throughout the Army.

DIRECTIONS FOR PHASE II

Phase II is a logical progression from Phase I. All the preliminary planning, analysis, and thorough preparation required before the full scale production of JSEP courseware in Phase II has been successfully accomplished in Phase I. Phase II calls for the development of 300 hours of instruction from the specifications designed in Phase I. Also, Phase II calls for a preliminary tryout using a subset of curriculum materials.

The specific tasks in Phase II are:

Task 12. Select hardware, where appropriate develop software, develop instructor training program and courseware for 300 hours of instruction.

Task 13. Conduct preliminary tryout

Task 14. Phase II Report

Phase II will lead into Phase III which calls for a continuation of the production of courseware (120 hours), a full scale tryout at two FORSCOM and two TRADOC sites, a cost and training effectiveness analysis, the development of a technology transfer plan, and a JSEP Final Report.

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APPENDIX

TASK 1 BRIEFING TRANSPARENCIES

A. Management, Logistics, and Control

Task 1. Conceptually define design requirements

Task 4. Develop FBSEP II implementation and management plan.

Task 11. PHASE I Final Report.

Task 14. PHASE II Final Report.

B. Project Design

Task 2. Review existing basic skills curriculum

Task 3. Review job/task analysis and select MOS clustering schema

Task 8. Develop cost-benefit tradeoff analysis specifying 'cost-per-feature' information.

C. CBI Design and Specifications

Task 5. Adapt or design specifications including instructional specifications, human factors and engineering requirements (hardware and software)

D. CBI Development

Task 12. Select the hardware, where appropriate develop software, develop instructor training program and courseware for 300 hours of instruction.

Task 15. Develop software and courseware for an additional 120 hours of instruction.

E. Evaluation and CTEA

Task 6. Develop evaluation standards.

Task 7. Develop FBSEP II evaluation plan.

Task 9. Conduct predictive Cost and Training Effectiveness Analysis.

E. Evaluation and CTEA continued

Task 13. Preliminary Tryout.

Task 17. Conduct evaluation and revision: i.e., demonstrate that the prototype system meets or exceeds the evaluation criteria developed under PHASE I; revise where appropriate.

Task 18. Conduct Cost and Training Effectiveness Analysis.

F. Technology Transfer

Task 4. Develop FBSEP II implementation and management plan.

Task 19. Develop Technology Transfer Plan.

G. Credentialing

Task 10. Develop standards and a plan for the civilian academic community to award a high school diploma based on completion of FBSEP II.

Task 1: Develop a highly effective, high technology low cost teaching system.

Features and benefits tradeoffs

Cost and effectiveness considerations

Task 2: Review existing basic skills curricula

TRADOC SSPs to review materials and PLATO courseware

FSU staff will extend the review to accommodate the rest of the Army

Sources of materials include ARI, TRADOC, FORSCOM, other services.

Formal checklist will be used to review all materials. (currently being designed and tested)

Purpose: To find useful materials and avoid duplicating the efforts of others

Task 3: Review job/task analysis and select MOS clustering schema

Purpose: To organize the tasks, skills, and competency requirements to apply to the largest groups of MOS.

RCA has developed a BSEP clustering scheme and taxonomy of skills

FSU Hazeltine will review the RCA Product and accept it, adjust it, or re-run the data.

Task 4: Develop FBSEP II implementation and management plan.

Purpose: To develop the first major element of the technology transfer plan: The plan and specification for implementing FBSEP II in TRADOC and FORSCOM.

- We view this task as the initiating step in successful technology transfer

- Visits to TRADOC and FORSCOM sites

- Develop maintenance and operations concepts and specifications

- Consult with ARI, TAG, TRADOC and FORSCOM staffs to develop strawman

- Brief plan, revise, submit report

Task 5: Design Specifications

1. Instructional Specifications
2. Engineering Requirements
3. Human Factors Considerations

Instructional Specifications

Component 1 Identification and Description of Competency

Component 2 Special Design Considerations

Component 3 'Grid' Sheets

FLORIDA STATE UNIVERSITY
FBSEP II
CENTER FOR EDUCATIONAL TECHNOLOGY

Engineering Requirements

Proposed System

TICCIT
MicroTICCIT
PLATO

Hand Held Computerized Tutor

Human Factors Considerations

1. Usability
2. Readability/Glare
3. Display
4. Correction Capability
5. Durability
6. Audio Quality
7. Maintainability

Develop Prototype* Lessons

Identify types of CBI lessons

Select lessons to be developed in each lesson type

Prepare lesson specifications (including tests, objectives, exercises)

Design lessons for PLATO and TICCIT

Develop and test prototypes on PLATO and TICCIT

Review product and procedure with ARI

Revise as required

* First full-scale and functional form of a new type or design

Task 6: Develop Evaluation Standards

Formative Evaluation

- Curricular structure
- Module effectiveness
- Conditions required for implementation

Summative Evaluation

- Impact on army instructional practice
- Impact on the soldier
- Impact on the army mission

Human Factors Evaluation

- Equipment - student interfaces
- Equipment - designer interfaces
- Equipment - instructor interfaces

Task 7: Develop FBSEP II Evaluation Plan

Define data required to answer each major question

Coordinate with AIR evaluation team

Identify sources of the required data

Adopt or adapt a compatible evaluation model

Develop data collection instruments

Establish location and schedule

Develop Evaluation PERT

Task 8: Cost Benefit Tradeoff Analysis

Ability of the design to meet defined requirements

Define alternatives 'between' and 'within' designs

Identify minimum required functions and features

Estimate unit measure of cost

Estimate unit measure of effectiveness (time, performance)

Task 9: Conduct Predictive Cost and Training Effectiveness Analysis

Approach

Definition of alternatives based on output of front end analysis (FEA) and the cost-benefit analysis of Task 8

Selection of model(s)

- Development of analysis
- Development of analytical scenarios
- Development of task listings
- Prediction of training programs
- Estimation of training effectiveness
- Cost analysis of training programs
- Comparison of alternative training programs
- Resolution of issues

Task 10: Develop Standards and Plan to Award High School Diploma

- Meet with representatives of TAG to gather in-depth data for plan
- Define political and jurisdictional realities
- Design a number of alternative approaches for consideration by ARI/TAG
- Select the most advantageous approaches to discuss with national, state, local authorities
- Propose the best alternative for approval
- Develop the detailed plan required to achieve the goal

Task 12: Select Hardware and Develop 300 Hours of Instruction

Select hardware based on the results of the analyses conducted in Phase I.

Establish production schedule and complete staffing

Lesson specification development procedure (handout)

CBI production procedure (handout)

Conduct IPRs and briefings

All development occurs at Florida State University

Task 13: Conduct Preliminary Tryout

Using materials developed according to prototype models:

Conduct tryout at mutually agreed site

Site Characteristics:

- FBSEP II population available*
- Command support
- Minimize expense

* Recent Army accessions may not be FBSEP II quality

Task 15: Develop 120 Additional Hours of Instruction

Based on the revisions in procedures adopted in Task 13, complete the production of 120 hours of instruction

Task 16: Conduct FBSEP II Tryout at 2 FORSCOM and 2 TRADOC Sites

FORSCOM: Ft. Lewis, Ft. Campbell

TRADOC: Ft. Bliss, Ft. Jackson

Tryout plans will be developed by associate director for Evaluation and Evaluation Review Committee, then presented at IPR prior to implementation.

Evaluators, designers, and in-charge staff will be at each site.

Task 17: Conduct Evaluation and Revision

Analyze data collected during all of the tryouts and from all sources

Prepare draft evaluation reports based on that data

Revise instruction based on the formative data

Revise implementation and management plans

Present all proposed changes in IPR

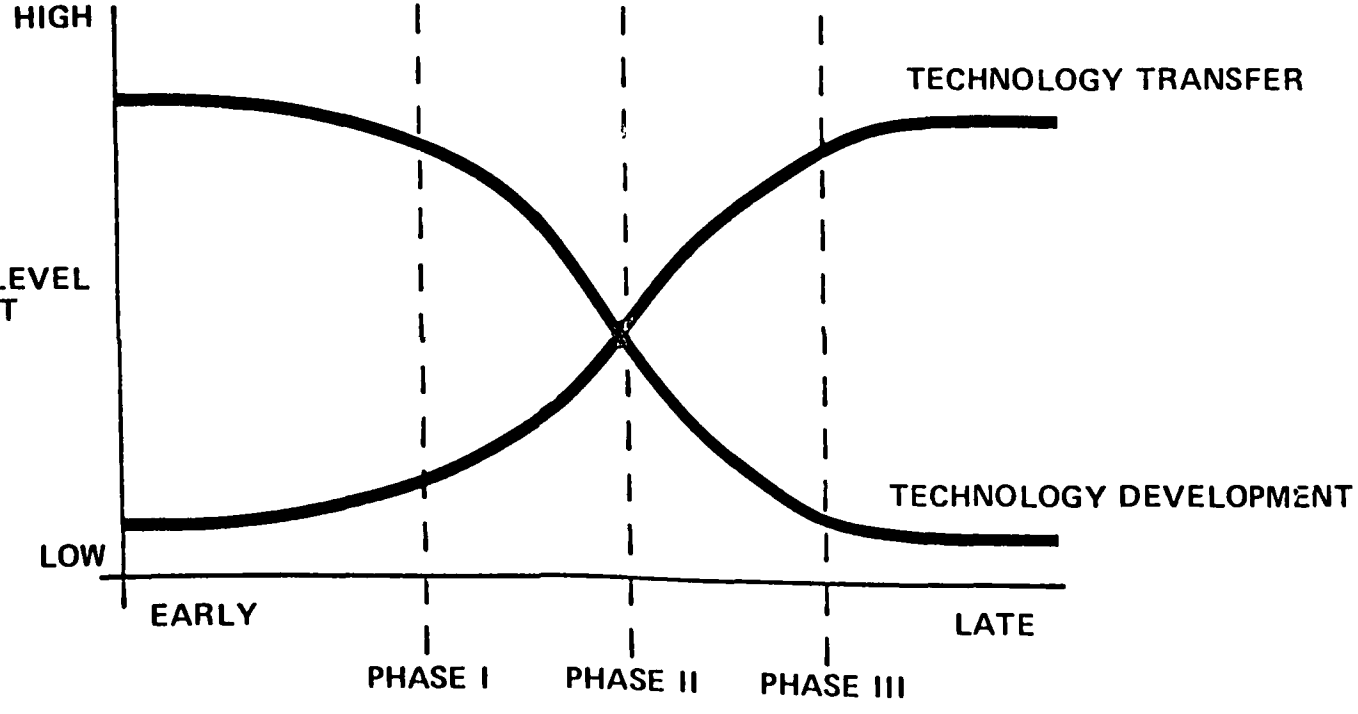
Task 18: Conduct Cost and Training and Training Effectiveness Analysis

Based on all previously collected cost data, and the results of the tryouts at the 4 sites.

Do the necessary analysis to complete the CTEA according to the model developed in Task 9

Task 19: Develop Technology Transfer Plan

Based on the requirement of the Integrated Development-Technology Transfer model, a complete plan will be developed.



The Integrated Development-Technology-Transfer Model. Implementation effort should begin early in the development cycle.

PHASE 1 Tasks 1-11

			Date	Months after award
Task 1.	Conceptually define design requirements	Begin	09-27-82	0
		End	11-19-82	1.5
Task 2.	Review existing basic skills curriculum		11-19-82	1.5
			05-02-83	7
Task 3.	Review job/task analysis and select MOS clustering schema		12-01-82	2
			06-01-83	8
Task 4.	Develop FBSEP II implementation and management plan.		11-19-82	1.5
			04-01-83	6

PHASE 1 Tasks 1-11 continued

			Date	Months after award
Task 9.	Conduct predictive Cost and Training Effectiveness Analysis.	Begin	03-01-83	5
		End	07-01-83	9
Task 10.	Develop standards and a plan for the civilian academic community to award a high school diploma based on completion of FBSEP II		11-19-82	1.5
			08-01-83	10
Task 11.	PHASE I Final Report.		07-01-83	9
			09-01-83	11

PHASE II Tasks 12-14

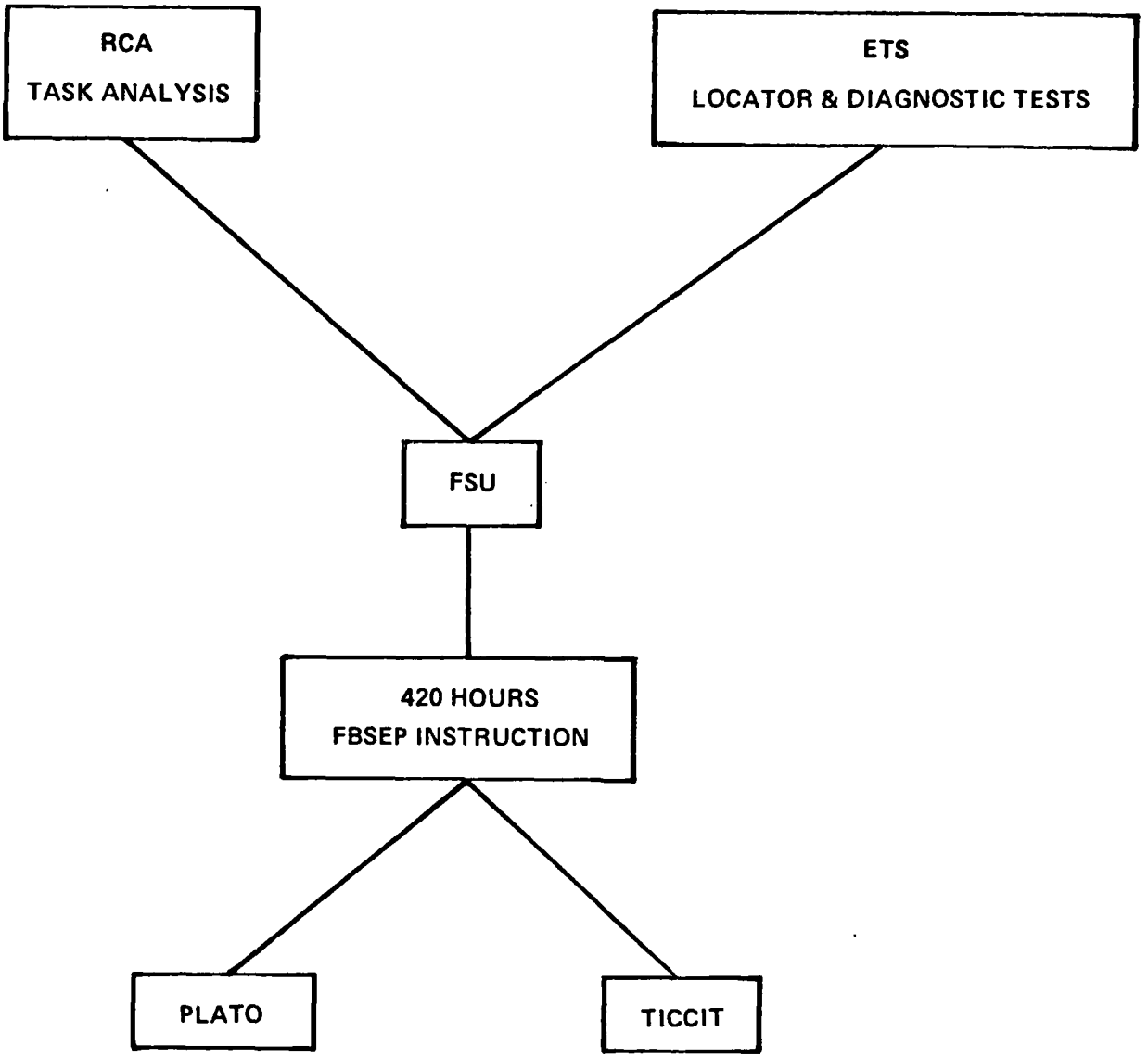
			Date	Months after award
Task 12.	Select the hardware, where appropriate develop software, develop instructor training program and courseware for 300 hours of instruction.	Begin End	05-01-83 07-01-84	7 21
Task 13.	Preliminary Tryout.		11-01-83 01-01-84	13 15
Task 14.	PHASE II Final Report.		06-01-84 08-01-84	20 22

PHASE III Tasks 15-20

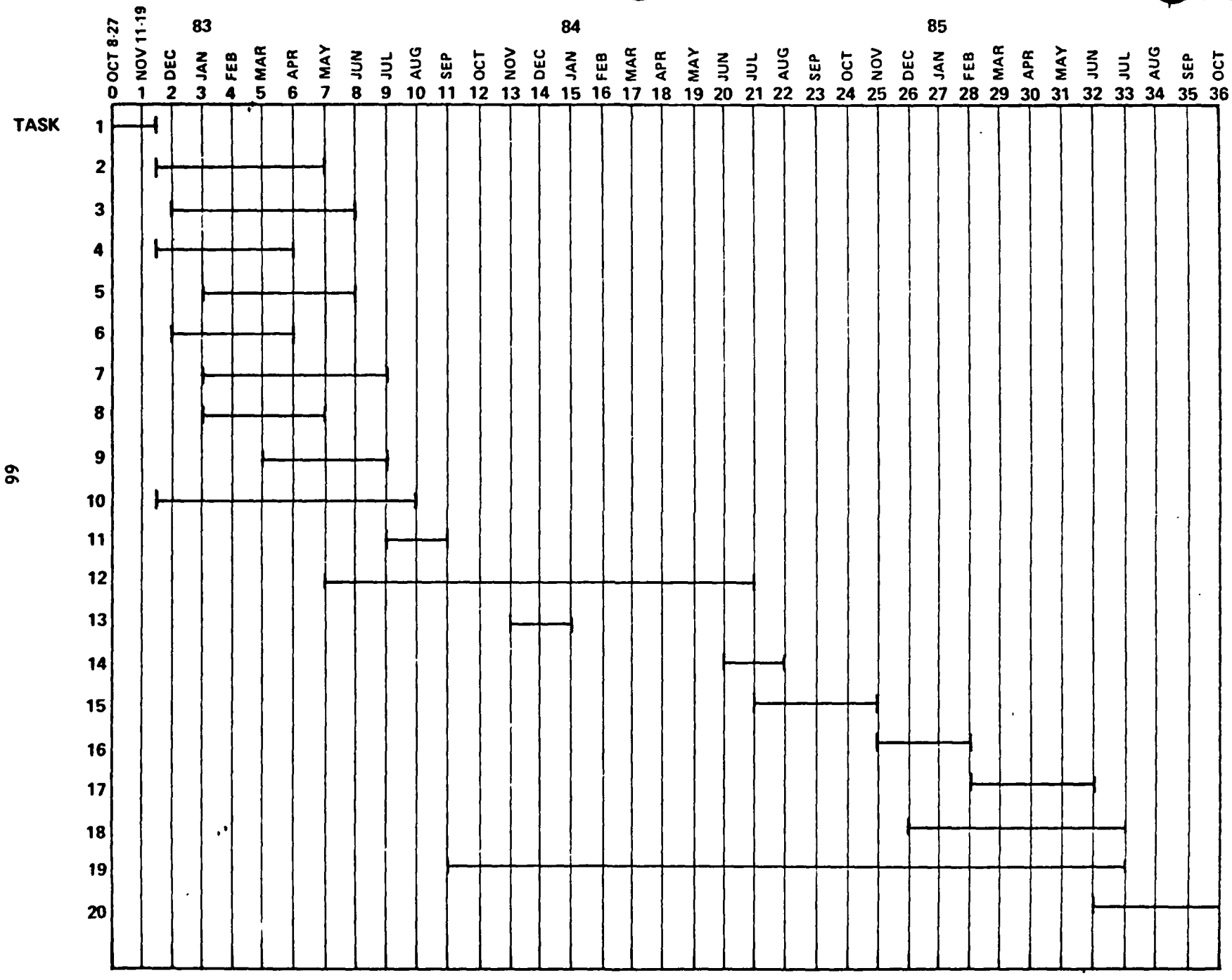
			Date	Months after award
Task 15.	Develop software and courseware for an additional 120 hours of instruction.	Begin	07-01-84	21
		End	11-01-84	25
Task 16.	Tryout FBSEP II at two (2) FORSCOM sites and two (2) TRADOC sites.		11-01-84	25
			02-01-85	28
Task 17.	Conduct evaluation and revision: i.e., demonstrate that the prototype system meets or exceeds the evaluation criteria developed under PHASE I; revise where appropriate.		02-01-85	28
			06-01-85	32

PHASE III Tasks 15-20 continued

			Date	Months after award
Task 18.	Conduct Cost and Training Effectiveness Analysis.	Begin	12-01-84	26
		End	07-01-85	33
Task 19.	Develop Technology Transfer Plan.		09-01-83	11
			07-01-85	33
Task 20.	Document the total process in the form of a final report.		06-01-85	32
			10-01-85	36



Tryout: 2 FORSCOM Sites
2 TRADOC Sites



REVISED GANTT CHART FOR FBSEP II

Learning Strategies in FBSEP II:

Three Possible Approaches

1. Embedded Strategies Training (60 - 70%)
2. Adjunct Study Skills Course (20 - 25%)
3. Instructor Training (10 - 15%)

Primary Learning Strategies: Some Examples

I. Acquiring & Storing Information

   a. Mnemonic Memory Aids
   b. Encoding with Visual Imagery
   c. Networking Ideas from Text

II. Outputting Information

   a. Retrieval Strategies
   b. Inferential Reconstruction
   c. Organizing a Communication

III. Using Information

   a. Problem-Finding
   b. Identifying Multiple Solutions
   c. Estimating