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Educational Technology Needs Assessment (ETNA) Task Force Report: Recommendations For The Use Of Technology In The DLIFLC Nonresident Language Program

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INSTITUTE FOR SIMULATION AND TRAINING

Prepared for
The Defense Language Institute Foreign Language Center

By

Institute for Simulation and Training
University of Central Florida

September 1992

**Educational Technology
Needs Assessment (ETNA) Task Force
Report: Recommendations for the Use
of Technology in the DLIFLC
Nonresident Language Program**

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IST

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Division of Sponsored Research

IST-CR-92-4

The Educational Technology Needs Assessment (ETNA), a project of the DLIFLC Research Division, was an initiative conducted to obtain, develop, and synthesize information regarding optimal applications of educational technology in foreign language education and training.

DLIFLC was assisted in this effort by the Defense Training and Performance Data Center (TPDC), Orlando, FL, and the Institute for Simulation and Training (IST), an affiliate of the University of Central Florida, Orlando.

The ETNA project addressed a number of issues associated with the use of educational technology in both resident and nonresident environments. Efforts in each area were designed to yield a variety of informational products. This report is one such product.

Information regarding other available ETNA reports can be obtained from the Research Division at the address below.

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Educational Technology Needs Assessment (ETNA) Task Force Report: Recommendations for the Use of Technology in the DLIFLC Nonresident Language Program

Prepared for
The Defense Language Institute Foreign Language Center

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September 1992

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DISCLAIMER

The opinions expressed in this report are those of the authors and do not necessarily represent those of the Defense Language Institute Foreign Language Center, the Department of the Army, or the United States Government.

FOREWORD

This report is one in a series of reports from a project conducted by the Defense Language Institute Foreign Language Center (DLIFLC) to examine present and future uses of modern technologies for the teaching of foreign languages. The project was performed with the assistance of the Defense Training and Performance Data Center (TPDC) in Orlando, Florida. Contractual assistance for the project was provided by the Institute for Simulation and Training (IST) at the University of Central Florida. The project was named the Educational Technology Needs Assessment (ETNA) project. ETNA was designed to provide specific information about technology use for resident and nonresident foreign language training.

The ETNA project addressed issues such as the following. What are the available present and future technologies to provide resident foreign language training? What special concerns exist in the use of technology for training in Chinese and Indo-European languages with non-Latin script? How can distance education technologies best be used to enhance the effectiveness of nonresident foreign language training? What are the legal and regulatory constraints associated with the use of foreign language broadcasts and satellite transmissions?

The project researched these issues through the following methodologies. Interviews were conducted with the faculty, students, staff and administrators at the DLIFLC. The interviews assessed needs and determined the status of technology for language instruction, both resident and nonresident. A review was conducted of the literature related to the use of distance learning for language instruction. A conference was held at the DLIFLC at which experts in the field presented the latest results in language learning technology as they apply to the resident program at the DLIFLC. Pilot tests of nonresident uses of video teletraining and of computer-assisted study courseware were evaluated. Several task forces were formed to address specific issues. Special issues, such as copyright, were addressed to determine how existing broadcasts and materials can be incorporated into technology-supported instruction. The end results of the ETNA project were comprehensive sets of recommendations for improving the uses of technology in the DLIFLC resident (see Bramble and Garrett, 1992) and nonresident programs.

This particular report documents the ETNA project recommendations for the use of distance education technologies in the DLIFLC nonresident program. The report offers a set of recommendations for the further implementation of video teletraining technology which has been under development at the DLIFLC since 1989. Many recommendations are derived from the results of prior ETNA reports including the review of the distance education literature, surveys of U.S.-based and European Theatre language program managers, and evaluations of pilot tests of courses using distance learning technologies. The recommendations were developed by a nonresident program task force which conducted a site visit to the DLIFLC in November, 1991. A listing of the

proposed task force recommendations was forwarded to the DLIFLC for review in December, 1991 and a draft report presented for review in July, 1992. The present report is the final report of recommendations and provides a detailed explanation of the recommendations of the task force.

EXECUTIVE SUMMARY

For the past several years the Defense Language Institute Foreign Language Center (DLIFLC) has tested the use of Video Teletraining (VTT) as a means to extend its nonresident language training efforts. This work originated with several projects which utilized the Defense Communications Teleconferencing Network (DCTN). More recently, the DLIFLC Distance Education Division has utilized the Army's Teletraining Network (TNET) to deliver language training to U.S. Army linguists stationed at military bases at various locations in the continental United States. The initial tests were of limited scope and duration. Recent work has involved more extensive delivery of language instruction via video teletraining to military bases. Courses addressing many languages and audiences are currently being delivered.

A special appropriation contained in the fiscal year (FY) 1991 Defense Appropriations Bill contained funding for the expansion of the Army's Teletraining Network to better serve the needs of the Army National Guard. The TNET system is operated by the Army Extension Training Directorate (AETD) at Army Training Support Center (ATSC), Fort Eustis, Virginia. A part of this funding provided for a major expansion of sites to serve the needs of the Guard for language training. As a result of this funding and the success demonstrated in the prior video teletraining efforts of the DLIFLC, a major expansion of the VTT language training program is underway. The VTT language training program is thus expanding rapidly from an effort of modest scope and experimentation to an operational system of increasing size and complexity. Within a year, what has been an effort involving a handful of classroom locations is scheduled to provide services to some 30 sites. The facilities for course origination at the DLIFLC are being expanded and improved and additional personnel have been assigned to address the increased workload of the VTT program.

For the past several years the DLIFLC has been conducting the Educational Technology Needs Assessment (ETNA) Project. The project, which has been assisted by the Defense Training and Performance Data Center (TPDC) in Orlando, Florida and the Institute for Simulation and Training (IST) at the University of Central Florida, has studied the use of modern electronic technologies for both resident and nonresident language training. In recognition of the envisioned expansion of the VTT program, the DLIFLC directed the ETNA project staff to study the present and intended uses of video teletraining by the DLIFLC and to formulate recommendations to assist the DLIFLC in expanding and improving its efforts in distance education, specifically through the use of video teletraining.

To that end, the ETNA project staff did the following. A thorough review of the literature on distance education was conducted (see Bramble, 1990c). The DLIFLC conducted pilot tests of language training via video teletraining and/or computer-assisted study. A thorough evaluation of these pilot tests was conducted by the ETNA project. (See Bramble and Bauer, 1992c.) A task force of outside experts was assembled to

review the information and make recommendations regarding the use of VTT in the DLIFLC nonresident program. The task force examined the results of these and other ETNA studies. It also reviewed selected additional reports of foreign language applications of distance learning. The task force conducted a one-week site visit to the DLIFLC in November, 1991. During the visit, the task force interviewed a cross-section of personnel at DLIFLC to determine their views on the video teletraining program and to elicit their suggestions regarding the expansion and improvement of the program. Based upon the information provided to it, the task force then developed a set of recommendations designed to assist the DLIFLC in its efforts in the video telecommunications area. The recommendations address the following areas:

- Staffing
- Coordination
- Evaluation, Student Data Collection, and Reporting
- Facilities and Equipment
- Course Effectiveness
- System Development
- Research Requirements

A summary of the general observations and task force recommendations was presented to the DLIFLC in December, 1991 for review and comment. A draft report of the recommendations was presented to the DLIFLC during a visit by Dr. Bramble in July, 1992. A summary of the general observations, general recommendations, and specific recommendations, as amended, is presented below.

GENERAL OBSERVATIONS:

The DLIFLC has successfully demonstrated the potential and feasibility of VTT technology as applied to distance learning of foreign languages and has attained a leadership position in this field.

2. Early VTT courses were experimental in nature and involved few sites and course participants. There is an effort underway at the DLIFLC to substantially expand the scope of the program. There is enthusiasm at many levels of DLIFLC for the expansion of the effort. An expansion of TNET sites has been made possible by a special appropriation in the FY91 Department of Defense budget.
3. The DLIFLC has identified FY92 resources necessary to provide for substantial near-term growth in both course offerings and clients served. DLIFLC teaching and technical support staff have been added to the Distance Education Division to support the VTT program.

4. The DLIFLC is entering a period of transition from experimentation and pilot testing to broader service delivery and institutionalization of the VTT program.
5. Now is the time to build a solid foundation to support VTT delivery of language instruction as an integral part of DLIFLC nonresident program services.
6. The effort to build a solid foundation for the VTT program should commence with a strategic planning process such as that described below.

GENERAL RECOMMENDATIONS FOR PLANNING:

It is recommended that the DLIFLC implement a *strategic planning* effort for the VTT program including the following:

1. Develop a clear *mission statement* for VTT. This is a broad statement of the unique purpose for which VTT exists and the specific function it performs. This will help the DLIFLC staff focus on the role of VTT within the available nonresident language training options as well as to identify the specific groups to be served. It is important to remember that an organization or program cannot be "all things to all people." Therefore, it is critical to determine the "market niche" of VTT and focus its efforts accordingly.
2. Establish *strategic policies* (parameters). These are management pronouncements that establish the parameters within which the organization will accomplish its mission. In other words, they state what activities VTT will and will not do. For example, the DLIFLC might determine that a VTT course will not be offered at a remote site unless that site has made a specified commitment to on-site coordination, facilities/equipment acquisition, and release of personnel for training. Or, it might determine that VTT will not be used for initial language training.
3. Assess DLIFLC *organizational strengths*. Identify the characteristics which contribute to the ability of the organization to achieve its mission. For example, one of the strengths of the DLIFLC is that it has a professional, highly trained, and committed teaching staff.
4. Assess *organizational weaknesses*. Identify the characteristics which limit the ability of the organization to achieve its mission. For example, the institute might determine that there are too few instructional design professionals or technical/engineering staff available to the program.

5. Examine the *organizational structure*. Critique the present organizational structure, which represents the current commitment of resources toward certain objectives. The examination may reveal the inappropriateness of the present structure for the emerging emphases in mission and objectives. The examination would identify such factors as span of control, gaps, redundancies, verticality (layers), and formal vs. informal organization.
6. Evaluate the *competition*. What other organizations attempt to fill the same need as VTT? For example, Satellite Communications for Learning, Associated (SCOLA), universities with teletraining programs, or local language programs might be identified as competitors. Determine how this relates to what the DLIFLC is trying to accomplish with the VTT program.
7. Perform an analysis of *external factors*. Examine those forces over which VTT or, for that matter, the DLIFLC has little or no control. For example, the institute might consider the vagaries of the congressional budgeting process, military funding level/process, or changes in military language priorities.
8. Establish *objectives* for VTT. Express the desired, measurable end results for VTT. It is suggested that the objectives for VTT focus upon outcomes such as student success, performance, and/or achievement, rather than process variables.
9. Develop *action plans* to implement the strategies identified in the planning process.
10. Review and update the plan annually to meet new and emerging conditions and assist in maintaining organizational focus.

SPECIFIC RECOMMENDATIONS:

A. Staffing

Prior success of the VTT efforts resulted largely from DLIFLC leadership vision and the quality, dedication, and expertise of a number of DLIFLC administrators and staff. This group has gained valuable experience in using the technology and is a key element for the future of the VTT program at the institute. As the program expands, additional staffing will be needed. The task force recommends that consideration be given in the near term to adding technical and instructional design staff in addition to instructors already scheduled to be assigned to the Distance Education Division. The task force recommends that appropriate staff development opportunities be emphasized to increase the level of staff expertise and broaden the base of distance education skills

throughout the institute. It further recommends that factors such as flexible staff scheduling, staff incentives, and rewards for VTT teachers be given careful consideration. Careful thought should also be given to the impact upon the resident program of increased requests for assistance in VTT course development and delivery.

B. Coordination

Because of the need of the video teletraining program to draw upon the expertise of staff from many organizational units in the DLIFLC, a high level of emphasis should be placed upon broad participation and effective coordination of the effort within the DLIFLC. To assure the success of the VTT program in meeting military linguists' training needs, a concurrent emphasis should be placed upon thorough coordination with these "clients." To affect the successful internal coordination of the program, the task force recommends that the DLIFLC consider developing formal agreements between the DLIFLC Distance Education Division and other supporting units (e.g., the language departments and schools, Evaluation and Research Division, Faculty and Staff, Curriculum, etc.) which clearly spell out roles and responsibilities of all parties. The task force suggests that regular VTT program planning and coordination meetings be held which include representatives of the contributing DLIFLC organizational units. An emphasis should be placed upon the timely distribution of information about the VTT program to all interested parties, internal and external. User involvement from the field is equally essential to the ultimate success of the program and should receive increased emphasis. User representatives should be asked to participate at all stages of program development from planning to summative evaluation of services provided by the VTT. Client satisfaction should receive a high priority. Clearly specified procedures and guidelines for program involvement are required to guide the efforts of both external and internal participants.

C. Evaluation, Student Data Collection, and Reporting

During FY91 a comprehensive evaluation of Video Teletraining (VTT) and Computer-Assisted Study (CAS) courses was conducted by the ETNA project (see Bramble and Bauer, 1992c). The evaluation identified a number of areas for improvement and fine tuning. The DLIFLC has implemented a number of improvements based upon these recommendations. The usefulness of evaluation and feedback was demonstrated by the success of refinements made to VTT services. However, current plans for VTT evaluation, data collection, and reporting appear quite limited. The task force suggests that a number of evaluation and data collection activities be included in the expanded VTT effort. These activities include obtaining background information about students prior to course participation, use of diagnostic testing procedures, gathering of attendance and performance data from the courses, and obtaining course ratings from students and site training personnel. Analyses of these data should be routinely reported to DLIFLC administrators and the managers and staff of the VTT program. Performance data should also be reported to participating military units and students. The task force

also recommends that the DLIFLC conduct an annual external evaluation of the program to assess progress and provide a recurrent basis for program improvement.

D. Facilities and Equipment

Facilities for the VTT utilized in the experimentation and pilot testing effort were makeshift. VTT course coordinators and instructors have identified a number of facilities and equipment limitations which should be remedied. Work is planned by the DLIFLC to both upgrade the facilities and increase the number of VTT teaching stations and the quality of the VTT teaching facility. In conducting the VTT pilot tests, DLIFLC, TNET, and local site personnel struggled to maintain network reliability at an acceptable level. Maintaining network reliability at 95% or greater and correcting existing operator and technical difficulties is essential to the long-term success of the VTT effort. The task force offers suggestions for technical training, facilities upgrades, and specification of classroom site facilities requirements. It also encourages experimentation with potentially less costly point-to-multipoint uses of the VTT, where instructionally feasible.

E. Course Effectiveness

DLIFLC staff opinion varies concerning the quality of the design, development, and delivery strategies for prior VTT language training courses. Because of their experimental nature, the pilot test courses may have received a greater level of design and development attention than in current courses in the more operational VTT program. Course ratings by participants in the VTT pilot test were quite positive. Every effort should be made to sustain and improve the quality of instruction in the current VTT courses. DLIFLC personnel have developed a report (DLIFLC, 1992) providing guidelines for VTT lesson development and teaching based upon the institute's experience with teletraining. To date, however, the instructional design model for VTT courses has been *ad hoc* and standards for course design and development are not well specified. The DLIFLC (1992) report and the teacher training now provided for VTT instructors should be helpful in maintaining and improving course quality. However, the task force offers a number of recommendations for VTT course development including the following. Carefully select courses for VTT based upon both user needs and DLIFLC institutional capability. Develop an instructional model and instructional design process for language training instruction offered through VTT. Develop a catalog of core language courses, carefully expanding course offerings based upon what is learned with the core set. Institute a process of continuous assessment and user feedback to improve courseware design. Develop ancillary course documentation and reusable course elements to reduce recurrent course development costs. Consider the differences in language learning requirements for Reserve Component (RC) vs. Active Component (AC) VTT students when developing courses to serve these two groups.

F. System Development

Earlier DLIFLC VTT efforts were experimental in nature and capitalized on opportunities to experiment with available Department of Defense VTT capabilities. Current plans include an expansion of VTT--additional staffing, VTT teaching facilities, and remote classrooms. As the VTT program grows, efforts are needed to *institutionalize* both resource requirements and the VTT program itself. The VTT effort is evolving from a small-scale experimental effort to an operational program of some considerable scope. Clear step-by-step planning is needed to effectively implement the scope of change envisioned. The task force suggests the following factors as important to the planning process: obtain adequate input from prospective users of VTT as to preferred courses, determine DLIFLC capability to support various course areas, explore how VTT services can be integrated with existing on-site language training services, and investigate the long-term availability of the VTT system (TNET) or alternative delivery systems. To guide system development, the task force recommends that the DLIFLC implement a *strategic planning process*. This process includes developing a clear mission statement, measurable goals and objectives, strategies to implement programs that meet the goals and objectives, operational plans for these strategies, and accountability standards with acceptable performance criteria.

G. Research

The task force suggests that there are a number of areas requiring further research if the VTT effort is to reach its full potential. Only a few DLIFLC staff appeared to recognize the research requirements of the program. Yet firm evidence is needed to support key directions for course design, development, and assessment, to integrate the VTT courses with other language training options available to participating units, etc. Task force recommendations in the research area include: developing short diagnostic tests of language proficiency to allow teachers to better target the instruction for participating students, comparing alternative instructional strategies and media formats, determining how to serve the specific language training requirements of different client groups, determining how VTT best enhances or is integrated with local language training options, determining approaches for designing maintenance/refresher vs. initial acquisition instruction, and conducting research on appropriate assessment and testing strategies for VTT instruction.

In summary, it is recognized by the task force that the DLIFLC VTT program is in a rapid state of development and expansion. The institute appears to be using its best efforts to effectively build the program and is already implementing a number of improvements to enhance the effectiveness and efficiency of the program. The VTT program presents a rapidly moving target. It is therefore difficult for an external group of consultants to stay abreast of the changes in the program. Some of the task force recommendations may have been implemented to some degree already or are planned in the future. Others may have been considered and discarded due to factors unknown to the

task force. However, the task force feels that the recommendations are valid, given the information available to it. The members feel that the DLIFLC should carefully review and consider the recommendations as it moves ahead with the further development of the VTT program.

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INTRODUCTION

BACKGROUND

For over three years, the DLIFLC has been developing and testing the use of VTT for foreign language instruction. This effort has been consistent with future planning for distributed training conducted by the U.S. Army Training and Doctrine Command (TRADOC). (See TRADOC, 1989.) During 1989 and 1990, the DLIFLC offered several courses to army military intelligence (MI) linguists using the Department of Defense Communications Teleconferencing Network (DCTN), most notably Arabic language instruction. More recently, beginning in the fall of 1990, the DLIFLC tested the use of VTT via two-way compressed video with the installation of U.S. Army Teletraining Network (TNET) equipment at several continental United States (CONUS) U.S. Army installations. The TNET communications network employed in the teletraining is described by Schall (1991).

Special funding contained in the FY91 Defense Appropriations Bill provides for an expansion of the TNET to serve the needs of the Army National Guard. The TNET system is operated by the U.S. Army Extension Training Directorate (AETD) at the Army Training Support Center (ATSC), Fort Eustis, Virginia. A portion of the FY91 funding provided for a major expansion of TNET sites to serve the needs of the Guard for language training. As a result of this funding and the success demonstrated in the prior VTT efforts of the DLIFLC, a major expansion of the VTT language training program is occurring.¹ The VTT language training program, operated by the DLIFLC Distance Education Division, is thus expanding rapidly from an effort of modest scope and experimentation to an operational system of increasing size and complexity. Within a year, what has been an effort involving a handful of classroom locations will reach a large number of VTT classrooms across the country. The facilities for course origination at the DLIFLC are being expanded and additional personnel have been assigned to the effort of providing language training at a distance via VTT.

VTT has the potential to serve many nonresident language training needs by projecting the expertise at the DLIFLC to linguist units both in and out of the continental United States.² As stated in Bramble (1990c), distance learning technologies may have

¹Keith Schall of AETD/ATSC stated on June 25, 1992 (personal communication) that his organization plans to expand to a total of 58 TNET sites by the close of FY92. The majority of the sites will be available for language instruction.

²Keith Schall stated on July 27, 1992 (personal communication) that TNET personnel have previously explored the feasibility of providing TNET services within the European Theatre and determined that while instruction originating from CONUS locations would be difficult, an in-theatre network supported by staffing/expertise from the DLIFLC was more feasible from technical and cost perspectives.

the potential (although not all have been tested by the DLIFLC) to provide language training services such as:

1. Short-term language courses
2. Full-length language courses
3. Language tutorials
4. Delivery of media and materials to enhance local program offerings
5. Local program improvement workshops or courses
6. In-service training for local language instructors
7. Other technical assistance to local programs

In theory, language-related instruction via VTT has the following potential advantages:

- Local language programs can gain access to high quality DLIFLC experts and instructors not normally available to provide language instruction on-site.
- VTT can provide for a high level of interaction between language students and DLIFLC VTT teachers.
- DLIFLC instructors can be utilized for nonresident VTT instruction without the need for extensive and costly travel.
- Remote access can be gained via VTT to DLIFLC staff expertise, instructional materials, and media for effective course design and delivery.
- Access can be provided for MI linguists to high quality and specialized language training on-site, without the requirement for costly travel to distant training sites.
- Articulation and coordination between local language program curricula and DLIFLC curricula can be facilitated by VTT.
- Potential long-run cost savings and/or higher quality language training options are possible.

Language training via VTT has the following potential limitations which should be addressed in future planning:

- The reliability of the current VTT equipment is less than 100%.
- Currently, equipment operation and program support functions at the local instruction sites are complex.

- There is a potential for mismatch between local needs and course design, if training is not properly coordinated.
- Current VTT media available for the instructional process have some functional limitations (e.g., problems in audio switching, single visible remote classroom).
- The cost of initial equipment procurement, equipment operation and maintenance, and communications may be viewed as high by some policy-makers despite the potential for long-range reductions to training costs.

PURPOSE

The purpose of the task force study was to examine the direction taken by the DLIFLC in serving nonresident training needs via VTT technologies and to make recommendations regarding steps the institute could take in further implementing and improving VTT in the future. The task force analyzed information from ETNA project reports and DLIFLC staff input. It then formulated recommendations to guide the DLIFLC's future efforts in the VTT area. It is hoped that the recommendations, based upon a variety of relevant information and having been reviewed by key personnel at the institute, will be of value in assisting with the continuing development and growth of the VTT program as a key support mechanism for nonresident language training originating from the DLIFLC.

The task force was asked to address the development of VTT primarily as a vehicle to serve the language training needs of Army linguists stationed in the continental United States. This was done for several reasons. First, the experience to date with the Army TNET system has focused upon the language training needs of U.S. Army MI linguists. Second, the TNET system presently serves the continental United States. Although planning is underway to establish a TNET site in Hawaii, there are no immediate plans to establish TNET installations in other theatres. Third, the information available to the task force indicated that of the U.S.-stationed linguists needing nonresident training from the DLIFLC, the U.S. Army has the largest pool of linguists requiring training.

Linguists in other services are also likely candidates for eventual VTT language courses. Military personnel stationed in other theatres may ultimately be served by VTT language courses. However, there are additional planning factors to consider in these VTT applications which go beyond the charge to the task force and would require additional future study by the DLIFLC.

METHOD

GENERAL APPROACH

The task force reviewed a number of ETNA project materials prior to beginning the work of formulating recommendations. These project materials included the following:

Review of the literature on distance education and its application to language instruction. (See Bramble, 1990c.)

Surveys of language program managers from U.S. Army Forces Command (FORSCOM) and U.S. Army, Europe (USAREUR) and other units stationed in the European Theatre. (See Bramble, 1990a, 1990b.)

Evaluations of DLIFLC pilot tests of VTT and computer-assisted study language courses conducted during FY91. (See Bramble, 1991; Bramble and Bauer, 1992a, 1992b, 1992c.)

Information gathered about lessons learned from large distance education providers in the United States

The task force conducted a site visit to the DLIFLC to gather staff input concerning the present and future implementation of VTT by the institute. This visit was made on November 12-15, 1991. The task force was charged by the DLIFLC to address the following specific elements of the VTT program during the site visit:

- Staffing
- Coordination
- Evaluation, Student Data Collection, and Reporting
- Facilities and Equipment
- Course Effectiveness
- System Development
- Research Requirements

Task force members were selected for their specific expertise related to the factors listed above. Members included: Dr. Steve Skiles, Distance Education Program Director at the Defense Training and Performance Data Center; Dr. William Bramble, Distance Education Program Manager at the Institute for Simulation and Training, University of Central Florida; Dr. Emanuel Mason, Chairperson, Department of Educational and Counseling Psychology, University of Kentucky; Mr. Douglas Yeager, Vice President for Marketing, National Technological University; and Mr. William Thomson, Educational Facilities and Program Planning Consultant. Dr. Skiles and Mr. Yeager were asked to provide general information and guidance in the formulation of

recommendations. Dr. Mason was asked to provide reports on task force activities in three areas: (1) evaluation, student data collection, and reporting; (2) course effectiveness; and (3) research requirements. Mr. Thomson was asked to provide reports in three areas: (1) staffing; (2) coordination; and (3) facilities and equipment. Dr. Bramble coordinated the activities of the task force and was responsible for the development of the final report.

The task force was directed by Dr. John A. Lett, Jr., Director of the DLIFLC Evaluation and Research Division, to approach the task from the following perspectives:

- The report of recommendations shall integrate the information gathered and reported by the ETNA project regarding distance education technology and its implementation by the DLIFLC.
- The report shall take a comprehensive, "corporate response to the user" perspective.
- The report shall include appropriate recommendations for future VTT support to units.

Following this guidance, the Institute for Simulation and Training provided ETNA project reports to the task force members in September, 1991. After reviewing the reports, the task force conducted a site visit at the DLIFLC in Monterey, California, on November 12-15, 1991. During the visit the task force met with DLIFLC personnel to obtain input regarding current and planned efforts in VTT. The task force met with staff from a number of organizational components and administrative levels. Meetings were held with staff from the following groups:

- Command Group
- Provost's Office
- Distance Education Division
- Curriculum Division
- Faculty and Staff (Staff Development) Division
- Facilities Management
- School Deans
- Department Chairs
- Academic Coordinators
- VTT Instructors
- Language Program Coordination Office
- Reserve Liaison Office
- Program Evaluation, Research, and Testing

At each meeting, the task force asked for general input about the VTT effort and for specific input concerning the factors selected as the focus for the site visit.

Information so obtained was recorded and collated. The team spent a portion of the final two days of the site visit analyzing and discussing the information and formulating tentative recommendations.

The task force members toured the facilities used to support the distance education program. The task force reviewed internal DLIFLC reports concerning target populations, staffing assignments, facilities, and procedures related to the VTT program. Mr. Douglas Yeager made a presentation to the task force and to interested DLIFLC staff on the development and status of the National Technological University (NTU), the primary distance education provider of graduate technical education in the United States. He discussed a number of relevant lessons derived from the experiences of NTU.

After reviewing the information gained, the task force formulated an initial set of recommendations for the further development of the VTT program at the DLIFLC. The recommendations were presented at two outbriefings on November 15, 1991, one for the DLIFLC Command Group and another for interested staff at the DLIFLC. Following the outbriefings, DLIFLC representatives were asked for their comments and observations concerning the recommendations. Subsequent to the site visit, a revised set of recommendations was provided to the DLIFLC. These were distributed to interested DLIFLC staff with a request to provide comments and corrections to the task force prior to the development of the final report. A draft version of this report was presented to the DLIFLC in June, 1992 and Dr. William Bramble discussed the draft report with interested DLIFLC staff during a visit to the institute the week of July 6, 1992.

SUMMARY OF ETNA PROJECT FINDINGS REVIEWED BY THE TASK FORCE

A. Distance Education Literature Review

A review and synthesis of the literature on distance education (of which VTT is an example) and its potential role in DLIFLC language instruction was conducted by the ETNA project. The resultant report (Bramble, 1990c) is one of a series of reports prepared by the ETNA project. The report reviews over one hundred relevant reports and provides answers to a set of ten key questions about distance education identified as important to the DLIFLC. The following summarizes the results of the study.

1. *What is distance education? What are its roots and what are its current directions? What does the future hold?*

Distance education has been defined as teaching/learning in which the teacher and learner are separated during the instructional process. Its historical roots are in correspondence study, but the emergence of modern communications and computing technology has allowed improvements over the traditional print (or print/audiotape) format for correspondence study. The technologies that support distance education are developing rapidly. It has been demonstrated in numerous research studies that distance

education can play a key role in addressing the needs of K-12, college, and adult learners. Continued growth is projected for distance education providers and courses.

2. *When is distance education appropriate?*

Learners tend to prefer face-to-face instruction, where high quality instruction is available locally and at times and places convenient to the learner. Where high quality, face-to-face instruction is not possible or practical, distance education has been shown to be a viable alternative for education and training. Distance education can improve access to instruction/training, provide access to subject matter experts and role models, provide interaction and joint activities with students at other locations, and increase access to information and instructional resources.

3. *Is there general evidence on the cost-effectiveness of distance education? What does it indicate?*

Additional rigorous research is needed in distance education. However, a consistent finding in the literature is that well-designed distance education is as instructionally effective as (sometimes more effective than) conventional face-to-face instruction. This finding appears to hold in many areas of application including aspects of language study and military training. Distance education start-up costs are substantial and continuing operating funds are needed. As a replacement for current services or as a method to provide a new service (perhaps not feasible using traditional methods), cost savings of perhaps 2:1 to 3:1 are reported in comparison to traditional methods, especially in cases where students are widely dispersed. Additional details about cost effectiveness are provided in Bramble (1990c).

4. *What are the general factors that contribute to the success of a distance education system? What should you do to make such a system work effectively?*

Successful distance education systems are *designed to address a valid need or set of needs*. Successful systems incorporate a combination of technology selected to meet the essential instruction/training requirements, rather than a single technology. Careful planning, management, and evaluation are required. Successful instructional programs are well-designed and grounded in current theory and practice. Motivated and competent personnel (teachers, curriculum specialists, evaluators, instructional designers, technology specialists, administrators, and local site facilitators) are needed to insure the success of a distance education system and the quality of the instruction/ training programs it offers.

5. *What technologies are used in distance education and for what purposes? What alternative configurations of technologies have been used?*

Two basic types of technology are used in distance education systems. (a) One type addresses the issue of reducing the perceived distance between teachers and students

and among students. This type includes electronic communications of one type or another. (b) Other technologies may be used on-site at the remote learning sites (e.g., videotape players, computers, print materials) to enhance opportunities for student learning in an off-line mode. For effective distance education, a mix of technology (with individual technologies selected based on their appropriate pedagogical roles) is desirable. At intermediate/advanced levels of language instruction, there appear to be higher requirements for interactive communications technologies in distance education systems than for many other types of (non-language) courses.

Electronic technologies that have been used in distance education broadly include one- and two-way audio, one- and two-way video, synchronous or asynchronous data communications, and other supplemental technologies. Specific communications technologies may include satellite communications, terrestrial microwave, terrestrial broadcast, telephone, data transmission, FAX, compressed video, still-frame video, etc. On-site technologies include print, audio tapes, videotapes, computer-assisted instruction (CAI), interactive video disc, compact disc-interactive (CD-I), etc.

Many technologies have been employed in distance education and each has its proponents. In general, the sophistication of the electronic technologies tends to run ahead of the sophistication in adapting them to education/training problems. The level of theory development in distance education is generally not advanced enough to easily determine the optimal configuration to address specific distance education problems. At the present, the design of each new application is addressed on an individual basis.

6. *What factors should be considered in planning, designing, developing, and managing a distance education system?*

Two types of factors are usually considered--(a) system design considerations and (b) instructional design and implementation. *System factors* include: management considerations such as having clearly stated goals and objectives; gaining approval for the system; selecting, acquiring, and operating a delivery system comprised of an appropriate mix of technologies; certifying and accrediting instruction; obtaining adequate capital funds and sufficient program development and operating funds; establishing formal agreements with participating agencies; mounting an effective public relations effort; establishing criteria against which to judge the success of the system; and establishing the means to evaluate it. Additional management considerations include appropriate placement of the distance education unit within the organization, appropriate staffing, setting service priorities, establishing mechanisms for network operation and field support, and developing a means for institutionalizing the system.

Specific *instructional program considerations* include: developing the necessary theory and procedures to design the instruction; developing an approach for effective course design and development; selecting and training competent instructors; training site

facilitators; developing and implementing instructional management, support and evaluation mechanisms; and delivering effective instruction.

7. *What factors should be considered in designing effective distance education courses?*

Key to the success of any distance education system is the quality of instruction it delivers. Factors contributing to the success of instruction at a distance include instructional design and development considerations and the development of practical and effective methods for incorporating interactive strategies in the instructional process. In the case of language instruction delivered by distance education, a specific theory of instruction remains to be developed which specifies the relationship between the requirements of language learning and the technologies available in distance education.

8. *What specific information is available regarding the teaching of foreign languages through distance education?*

Three purposes of existing (distance) language instruction are illustrated in the Bramble (1990c) report. These are: teacher training; distribution of instructional support materials; and foreign language instruction through distance education. Each of the projects reviewed in the report claimed a degree of success in offering distance education for language instruction. Based upon the results of these projects, distance education appears to hold promise for several aspects of language instruction--teacher training, distribution of video support materials, introductory college-level language courses, and other short courses at an introductory level. The literature did not contain examples of higher-level language instruction via distance education.

9. *What lessons have been learned about foreign language instruction/training in other distance education programs/projects that can assist the DLIFLC in planning for the possible use of distance education for its nonresident program?*

The feasibility of utilizing distance education to address language-related staff training, instructional support, and course delivery has been demonstrated in various settings. Even correspondence courses supported by asynchronous data communications have been reported to be feasible for certain aspects of language learning. Interactive video by terrestrial microwave or satellite have been utilized with greater success. Due to the pedagogical requirements of second language acquisition, emphasis needs to be placed on interactive technologies for higher-level language instruction. Students of foreign languages participating in distance education courses (like most students) often state that they prefer high quality face-to-face instruction if it is available. However, if it is not, students appear to perform well in distance education courses and enjoy learning by this means. Lessons learned in distance education programs in general (e.g., addressing valid needs, designing high quality instruction, applying appropriate management methods, etc.) appear to apply to language learning applications as well.

Again, there is currently no coherent theory nor substantiated methodology for optimizing language instruction via distance education reported in the literature. The DLIFLC is in an excellent position to develop these and should do so through its VTT program.

10. *How should distance education programs be evaluated?*

The importance of high quality evaluation of distance education programs is widely documented. The importance of pre-specifying criteria for program success and the early and continuous involvement of the evaluator in the program is stressed in the literature. Thus, both formative and summative evaluation are usually required in distance education programs. In evaluating distance education programs, questions about the *delivery system* vs. the *instruction provided* need to be separated. Both cognitive and affective factors should be addressed in evaluating the instruction. Cost analysis is another important evaluation concern.

B. Surveys of Language Program Managers

Another task of the ETNA project was to assess the level of interest of military intelligence (MI) units and language training managers in participating in future distance education efforts of the DLIFLC. In this portion of the study, the ETNA project conducted two surveys of language program managers (LPMs) to determine their familiarity with language learning technology and their level of interest in future participation in language training delivered from the DLIFLC through distance learning technologies. The surveys were administered in April, 1990, one at the annual meeting of U.S. Army Forces Command (FORSCOM) language program managers in Atlanta, Georgia, and another at the annual meeting of European Theater language program managers, in Munich, Germany. The results of these two surveys are summarized below.

1. FORSCOM

The 1990 annual meeting of the FORSCOM Command Language Program was held in Atlanta, Georgia, on April 5-6. LPMs from the various FORSCOM CONUS units were present at the meeting. The meeting afforded the ETNA project an opportunity to collect information from twenty-two LPM personnel regarding the need for, and perceived feasibility of, using distance education technologies to support linguist language training requirements in their units.

Dr. William Bramble of the Institute for Simulation and Training attended the meeting, delivered a brief presentation on distance education, and administered a questionnaire to the LPMs. The questionnaire included items which addressed the following five areas:

- Current use of technology
- Available equipment
- DLIFLC language training materials on-site
- Unmet program needs
- Interest in distance education/teletraining

The analysis of data gained from the survey is included in a report of the ETNA project (Bramble, 1990b). The analysis supports the following conclusions.

While instructional technologies were perceived by language program managers as potentially useful to local language training programs, the equipment available to their programs consisted largely of audio tape players and video cassette recorders (VCRs).

2. Some additional equipment was being purchased; notably, computers and satellite dishes (to receive SCOLA programming).
3. DLIFLC nonresident language instruction materials are used in FORSCOM language programs. Of these materials the Foreign Language Maintenance/Refresher and Improvement Courses (FLAMRIC) were seen as most important to program needs, followed by DLIFLC Basic-Course materials and the Professional Development Program Extension Courses (PDPEC).
4. When asked to identify unmet language training program needs, the LPMs identified a broad variety of needs and problems with no consistent set of priorities emerging. Reported AC vs. RC language training needs differed as a result of differing skill levels among linguists and the availability of these linguists for training.
5. The LPMs endorsed the concept of receiving language training through teletraining and most indicated their willingness to participate in this training if it were available to them.
6. When asked to rank alternative scenarios for delivering language training, LPMs generally stated that they preferred on-site instructional options to remote means. However, where high-quality training was unavailable locally, distance delivery was reported as a desirable option.
7. The highest ranked facets of language training via distance education technologies were on-call tutorial assistance, followed by full language courses and intensive short courses.

2. European Theatre

The first European Theater Linguist Conference was held at the Foreign Language Training Center, Europe (FLTCE) from April 22-27, 1990. The conference was hosted by FLTCE and co-sponsored by the DLIFLC and the National Cryptologic School, Europe (NCEUR). Language program managers representing the U.S. Army, Navy, Air Force, NCEUR, and other DoD agencies were present at the meeting.

The ETNA project was afforded an opportunity to gather information through administering a questionnaire to 28 DoD language training personnel attending the meeting. Dr. William Bramble attended the meeting at the request of Dr. John A. Lett, Jr., Director of Research and Evaluation at the DLIFLC, and at the invitation of the conference sponsors. He made a brief presentation on distance education and administered a questionnaire parallel to that used at the FORSCOM meeting. The results of the study are documented in Bramble (1990a).

As evidenced by the responses to the questionnaire, LPMs expressed enthusiasm for the potential of distance education to serve future language training needs and for participating in such a program if one were to be developed to serve the needs of linguists stationed in the European Theatre. The LPMs reported the availability and use of computers and communications technologies to support language training was extremely limited, but expressed considerable interest in the potential use of these technologies in their programs. Interest levels were consistent across all branches of the service represented at the meeting.

The reader should note that while the LPMs in this study endorsed the application of distance learning technologies to language training within the European Theatre, the task force is not aware of the development of a teletraining system to serve this theatre. While the development of such a system is technically feasible, there are technical issues to be resolved. The task force recommendations in this report do not address the special issues of establishing VTT service outside of the continental United States.

C. Video Teletraining Pilot Tests

1. Background

A series of pilot tests was conducted by the Defense Language Institute (DLIFLC) during FY91 and evaluated by ETNA project personnel. (See Bramble and Bauer, 1992c.) The pilot tests investigated the potential use by the DLIFLC of Computer-Assisted Study (CAS) and VTT to address the language training needs of practicing military intelligence linguists.³ The training was developed and provided by the DLIFLC. The participants in the pilot tests were military linguists stationed at Fort Lewis, Washington and Fort Ord, California or were linguists from the Washington Army National Guard (ARNG). Participants included the 201st MI Brigade (Bde), 2/9 Aviation (AVN) Battalion (Bn), 199th MI Bn, the I-Corps Language Training Facility staff at Fort Lewis, the 107th MI Bn at Fort Ord, and the 341st Washington National Guard MI Bn.

Three types of training technology were employed in the tests. These included CAS, VTT, and combined CAS/VTT. Languages addressed were Korean, German, Russian, and Japanese. The focus of the training varied somewhat (by course) depending upon the precise needs of the units involved, but generally included language refresher and enhancement training for MI linguists whose military occupational specialty (MOS) was voice interceptor or interrogator. In addition to the foreign language objectives of the training, military content and current events/topics were included. For example, in VTT courses addressing the MOS-related needs of interrogators, practice in interrogation skills was included. An earlier VTT course (January-February, 1991) for Korean linguists at Fort Lewis to prepare them for the 1991 Team Spirit exercises, was originally scheduled to be evaluated by the ETNA project team. However, the VTT portion of the training was aborted due to problems with the VTT equipment and insufficient staff training for its operation.

³ While CAS instruction was not the focus of the task force's deliberations and recommendations, it can be considered as a media option within the broader context of teletraining. A review of the CAS pilot-test results is therefore included in this section of the report.

A summary of the pilot test courses evaluated by the ETNA project is as follows:

<u>Course</u>	<u>Participants</u>	<u>Dates</u>	<u>Instruction</u>
Korean CAS	107th MI Bn 201st MI Bde 2/9 AVN Bn	9/90- 12/90	CAS - 5 lessons
German VTT	341st ARNG MI Bn	4/91	VTT - 60 hours
Korean CAS/VTT	341st ARNG MI Bn 199th MI Bn	4/91- 5/91	CAS - 5 lessons VTT - 60 hours
Russian VTT	341st ARNG MI Bn	6/91	VTT - 60 hours
Japanese VTT	341st ARNG MI Bn	6/91- 7/91	VTT - 60 hours

Course development was undertaken by the appropriate schools at the DLIFLC with assistance from relevant educational technology, curriculum, staff development, evaluation, distance education, and program coordination staff. Efforts were made to assure that the instruction was developed in accordance with accepted pedagogical principles, although more instructional staff were made available for VTT course design and development than for CAS. Efforts were undertaken to coordinate the development of the courseware with the participating units to assure that the training met both the units' needs and the needs of the individual MI linguists participating in the courses. CAS development occurred during the five-month period preceding course delivery. VTT course development typically occurred during the 2-3 weeks prior to course delivery, but was conducted by a larger instructional team.

The technologies used in the tests were selected based upon their potential effectiveness for language instruction and on the basis of feasibility and cost. In the case of the Korean CAS instruction, the Apple Macintosh SE computer was used as the instructional platform. With the addition of Macrecorder, and a Korean text font, the computer was able to deliver instruction employing audio, graphics, and text. Lessons were developed using HyperCard. This both facilitated ease of development and provided an appropriate presentation format. CAS instruction was conducted in the language training classrooms of the 107th MI Bn at Fort Ord and the 201st MI Bde at Fort Lewis,

via Macintosh computers provided by the DLIFLC. VTT utilized the Army's TNET system (see Schall, 1991). TNET includes two-way, compressed video technology using Compression Laboratories' Rembrandt II Gallery ® and digital communications via Ku-band satellite links. VTT thus included fully interactive compressed video and audio supplemented by graphics. VTT instruction originated from the DLIFLC VTT facility at the Presidio of Monterey, California, and was received at the Foreign Language Training Facility, operated by the I-Corps Language Program and located at North Fort Lewis, Washington. The DLIFLC provided CAS and VTT site coordinator training to the participating language training staff of Fort Ord and Fort Lewis to prepare them to manage the equipment and training on-site.

The DLIFLC Evaluation and Research Division conducted the evaluation of the pilot tests with assistance from the Defense Training and Performance Data Center in Orlando, Florida, and the Institute for Simulation and Training, University of Central Florida. Intensive evaluations (including evaluator site visits) were conducted for the Korean CAS, German VTT, and Korean CAS/VTT courses. Separate reports were developed to describe the results of these three tests (Bramble, 1991; Bramble and Bauer, 1992a, 1992b). The DLIFLC also collected data for the Russian VTT and Japanese VTT courses and these results were incorporated in the final comprehensive evaluation report (Bramble and Bauer, 1992c).

The project evaluation addressed a number of objectives. The objectives were divided into two areas: (1) *objectives related to the delivery system* and (2) *objectives related to the instruction provided*.

Objectives related to *delivery system* included determining: the appropriateness of the media used in the pilot tests; the viability of the technology as a means for providing access to the training; the reliability of the equipment and communications; the cost of providing the training; and the acceptability of the delivery approach to the participants. Objectives related to *instruction* included determining: the effectiveness of the training in meeting established training objectives; the effectiveness of instructional techniques in the context of the training systems; the effectiveness of the training systems in facilitating and maintaining student motivation; the relationship of the training to student variables; and the overall effectiveness of the training in supporting the annual language training requirements of the participating units.

Evaluation data were obtained from multiple sources. Sources included the course participants (students), remote site coordinators, and DLIFLC staff (including instructors, course developers, technical staff, and program coordination staff). Data collection instruments included: student background questionnaires; local language program description forms; instruction logs; student questionnaires; student interview forms; site coordinator and unit training personnel interview forms; teacher interview forms; course description forms; and student achievement tests.

2. Results

The pilot test evaluation results are summarized below.

Student Achievement. Each of the five courses, except for the Russian VTT course, included pre-post testing of student achievement. In all areas where achievement gain was measured, students' language skills improved as a result of the training.

Student Ratings and Comments. Students were favorably impressed with the methods of instruction (CAS and VTT) used in the pilot tests. Students gave high ratings to the technical quality, utility, and motivational quality of the technologies used to deliver the courses. They stated that the training ranked well in comparison to other training technologies with which they were familiar and that the training was helpful in improving MOS-related skills. Students felt that the rate of learning and the quality of training exceeded that which was available through local language training programs. They stated that CAS strengths appeared to be individualization, ease of use, and flexibility of use. They felt that CAS best addressed reading and listening skills and specific components such as vocabulary, grammar, reading, and listening comprehension. Students felt that VTT strengths were in providing long-distance access to expert DLIFLC language instructors; allowing for interaction between the teachers and students, and in transmitting videotapes, audiotapes, and graphics (e.g., authentic materials, word lists, photos, charts, etc.). They felt that VTT effectively addressed reading skills, and that it was especially effective in addressing speaking and listening skills. Students felt that both technologies assisted the learning military content and that VTT was effective for teaching interrogation skills.

Site Coordinator Comments. Site coordinators generally felt that DLIFLC CAS and VTT instruction could improve the language skills of MI linguists. They stated that this type of instruction was a valuable addition to local language training programs. At sites where well established language programs exist, the coordinators felt that the technologies could serve to enhance and improve local offerings. At sites where local programs are less established, or where linguists in lower density languages are not well served, site personnel suggested that CAS and VTT could provide vehicles for primary, rather than supplementary, instruction. The coordinators praised the quality of instruction received from the DLIFLC and the willingness of the DLIFLC to provide this type of assistance to local programs. They stressed the importance of effective coordination with field personnel and adequate technical training for participating site personnel.

DLIFLC Teacher Comments. VTT instructors were impressed with the TNET system as a means to offer instruction at a distance. Although the technology was new to them and they experienced some growing pains in adjusting to the new medium, they felt that the versatility of the system offered an excellent means to provide distributed language training. Teachers generally enjoyed the experience of teaching over the

system. However, they felt that improved system reliability and course developer and instructor training required greater emphasis in the future.

Technical Data. CAS instruction, once the software was thoroughly debugged, had high reliability and was judged easy to use and manage at the local level. The computer hardware had few problems and problems that did occur were easily remedied. The VTT system required a higher level of technical sophistication to operate and maintain. Improved site personnel training and troubleshooting procedures were suggested in order to maintain VTT reliability at an acceptable level for effective training. As the pilot projects progressed, the VTT staff at all levels gained much of the necessary technical expertise and the VTT equipment operated more reliably. It was verified that VTT and CAS courses must be carefully designed in advance. The evaluation results suggested that effective course development requires the participation of technology professionals, instructional designers, and subject matter specialists. Participants felt that CAS and VTT can be feasibly combined to provide enhanced training opportunities. However, they emphasized that care must be taken in the course design/development phase to specify an instructional design which shows how the two technologies should be combined to offer an effective, integrated approach to instruction.

3. Lessons Learned

Many lessons were learned from the CAS and VTT pilot tests. These are documented in detail in the evaluation reports. In general, the pilot tests demonstrated the potential of the CAS and VTT technologies to provide excellent resources for remote language training for military linguists. The central role of the DLIFLC in developing and delivering language courseware to MI units via these technologies was amply demonstrated. The results provided support for expanded development of these technologies by the DLIFLC in the future. A summary of the identified strengths and limitations of the CAS and VTT technologies follows.

a. Identified Strengths of VTT and CAS

Based upon the pilot-test participant responses the following strengths of VTT as a nonresident language training technology were identified:

- Can address most aspects of language refresher training
- Provides an approach to intensive refresher training to either AC or RC military linguists, given proper design
- Is especially effective with speaking and listening skills
- Can address listening comprehension
- Can assist in the testing of listening and speaking skills
- Can address grammar and vocabulary skills
- Can present current events, news, and politics through a variety of media

- Can provide practice in interviewing/interrogation and in MOS-related skills that emphasize listening and speaking
- Can effectively incorporate the use of videotapes and graphics
- Allows real-time interaction with the instructors

Participant responses pointed to the following strengths of CAS as a nonresident language training technology:

- Effective at vocabulary and grammar instruction
- Effective at reading comprehension instruction
- Effective for listening--translation and comprehension
- Effective for contextual grammar comprehension
- Can perform testing/diagnosis for reading and listening skills
- May address speaking at beginning levels
- Can present information on military topics
- Flexible, convenient, and self-paced
- Interactive capability provides immediate feedback to students
- User friendly and easy to use

b. Potential Limitations of VTT and CAS

Participant responses pointed to the following potential limitations of VTT as a nonresident language training technology:

- Technical reliability less than 100%
- Eye strain and fatigue were observed in longer sessions
- Somewhat cumbersome technical protocols for interaction, and student participation
- Audio switching, quality, and delays
- Problems with some types of videotape transmissions (e.g., tapes including high levels of motion) using the compressed digital format
- Studio and classroom limitations may hamper instruction if not carefully designed
- Problems in addressing the heterogeneity of students' prior skills in some cohorts presented for instruction
- Apprehension of some students about the lack of physical presence of classroom teacher

Participant responses pointed to the following potential limitations of CAS (as implemented) as a nonresident language training technology:

- Current CAS not specifically designed to supplement other nonresident instructional offerings (e.g., VTT, local courses)
- Limited scope and content of prototype lessons used in pilot test

- Software debugging required if programs not thoroughly bench tested
- Imprecise corrective feedback in speaking activities
- Current limited diagnostic, feedback, or remedial alternatives
- Current lack of capability to record data on student usage
- Limited user documentation available
- Absence of personal touch of a teacher

c. General Lessons Learned

A number of general lessons were learned from the overall pilot testing effort. These can assist with future DLIFLC applications of these technologies. Many of these factors are being addressed by the DLIFLC and/or TNET staffs. Lessons learned from the pilot tests are summarized here by topical area.

(1) Technology Lessons

- The operational requirements of the present VTT equipment/networking configuration place a high level of demand on network, course delivery, and remote-site personnel. It takes considerable effort to maintain network operability at the high level of reliability required for successful language training. The availability of technically trained personnel at all levels is essential. System redesign or refinement may enhance utility and ease of operation.
- Microphone switching constraints are sometimes reported as a problem for VTT, especially at the classroom level. Delays in switching between graphics and video occur as well. Added participant training, improved protocols, and/or alternative equipment are indicated.
- Detailed specifications are required for DLIFLC VTT facilities modifications and the classroom setup at the remote training locations. Requirements for layout, furniture, air conditioning, telephone, FAX, photocopying, and reliable electrical power at the remote sites should be specified ahead of time. Requirements for local staff support and training should be made explicit. Careful planning and coordination are required for successful operation of VTT remote training sites.
- The computer equipment for CAS is less complex. It operates more reliably and is less prone to problems than the VTT equipment. Trained site personnel are required, however, to instruct students in the use of CAS, to provide instructional management, and to stand by for occasional troubleshooting and assistance.

(2) Course Development/Lesson Planning

- Careful advance work is necessary with field units scheduled to receive VTT training in order to establish unit training priorities and determine the

characteristics of the soldiers scheduled to receive the training. This work should commence with several months' lead time in order to allow course developers to spread their efforts across a reasonable period of planning time. Approximately 15 days of team effort were judged by the teachers as sufficient to plan for the type of instruction in the 60-hour pilot test courses. However, the teachers stated that these planning days would be more effective if spread across several months' planning time. Careful advance work is also necessary to assure that the VTT equipment is fully operational and support staff are fully prepared for course delivery. This was demonstrated by the technical problems that forced the cancellation of a planned "Team Spirit" Korean language course in January 1991 and the corrective actions required prior to subsequent DLIFLC VTT course delivery.

- VTT courses require greater planning and preparation than corresponding classroom teaching (especially the first time a course is offered). Course preparation includes (at a minimum): specification of the course goal and objectives; specification of effective instructional strategies and sequencing; detailed daily lesson planning; development of course materials and graphics; identification of appropriate pre-taped media; and planning for alternative (backup) learning activities during potential system outages.
- Careful design is required to optimize language instruction, using the media available in the VTT system. A fast-paced, highly interactive course with a variety of motivating instructional activities appears to be effective for optimizing student learning and minimizing the perceived distance between instructors and students.
- A team effort involving curriculum staff, an instructional design specialist, a technology specialist, and experienced teachers appears desirable to develop an optimal CAS or VTT course design.
- The CAS lessons used in the pilot test were prototypes with limited content. Fuller lessons are required for operational courses in the future. All features of CAS, with the exception of the lessons focused on speaking skills, appeared to be effective in the pilot test.
- CAS lessons should be carefully developed to capitalize upon the unique strengths of the technology, whether CAS is used as stand-alone instruction or combined with local instruction offerings or VTT. In cases where CAS is combined with VTT, the integration of VTT and CAS portions of the training should be carefully articulated in order to maximize the effectiveness of the overall instructional program.

- Fatigue and eyestrain are factors that need to be addressed in planning instructional days via VTT and CAS. Interspersing CAS and VTT activities appears desirable when they are used in combination. Shorter instructional days might be considered for VTT courses or VTT might be interspersed with CAS, practice exercises, group activities, or local language training activities.

(3) Course Delivery

- Careful coordination and maintenance of good rapport with local training site staff is required. A partnership with local staff, to the point of "joint ownership" of the training, may facilitate VTT program success and prevent the perception of VTT as a threat to local jobs or program funding.
- Highly skilled instructors who also have a good on-camera presence optimize the chances for success of a VTT course. Outgoing, energetic, personable instructors who develop good student rapport, motivate students, and appropriately incorporate humor, are optimal.
- Systematic pre-service orientation and training for VTT should be provided for course developers, instructors, and local training site staff to maximize course quality and facilitate smooth course delivery.
- System reliability above 95% and responsive troubleshooting capability are required for optimum VTT course delivery. Ultimately, system reliability should approach 100%.
- A team approach to VTT course presentation appears to offer instructional advantages over a single-instructor approach. However, the added cost of additional instructors must be taken into consideration.
- The effective implementation of computer-based instruction activities requires the assistance of skilled, local, training staff familiar with CAS.

(4) Evaluation and Record Keeping

- Student progress should be systematically recorded and appropriate feedback provided. As VTT offerings increase, an automated student record system will be required.
- A pre-post measure of student achievement, carefully tied to course objectives, should be developed for each course. Since much of the instruction in VTT courses may be aimed at general proficiency maintenance or improvement, the pre-post measure could be a performance profile generated through diagnostic testing or through a face-to-face oral interview conducted via TNET. The pre-

post administration of such tests can assist in determining the success of the course and identify general areas needing improvement. A standard questionnaire to identify course strengths and areas for improvement is also desirable.

- Feedback mechanisms should be built into VTT course delivery to allow for mid-course corrections. Early feedback from the students can allow for important mid-course corrections and improvements.
- An automated student record-keeping capability should be built into future CAS courseware to record progress on the CAS lessons. An expansion of the CAS concept could provide for student testing and recording of progress in both VTT and CAS portions of combined CAS/VTT courses.

(5) Recording Lessons Learned

- Numerous lessons were learned from the pilot test courses. These are documented in the pilot test evaluation reports and address a full range of issues including technical features, field coordination, pedagogy, course and lesson development, selection of students, student motivation, etc. These lessons should be reviewed for applicability to future courses.
- As the DLIFLC implements additional CAS and VTT courses, the documentation of additional lessons learned is essential. This can both provide a basis for general program improvement and serve as input to the development of improved instructional methods, staff training, and operational guidelines.

TASK FORCE CHARGE

Having reviewed the documents provided to it (summarized above), the task force was charged by the DLIFLC to address seven issues. These are listed below, along with sample questions which were provided for each of the issues.

A. Staffing

What are the current DLIFLC staff resources available for the VTT program? What additional staff are required? What are the staff training and development requirements of existing and future staff assigned to distance education projects? What are the most effective long-term methods to address these training needs?

B. Coordination

What is the current mechanism for coordinating the VTT effort within the DLIFLC? What is the mechanism for coordinating and supporting VTT delivery of language-related training to field units? What adaptations or improvements are desirable?

C. Evaluation, Student Data Collection, Reporting

What ongoing monitoring and/or evaluation activities should be sustained as the VTT system attains a broader operational status? What is the current scheduling and record keeping system for the VTT courses? What provisions have been made for feedback and reporting? How can these be improved and automated?

D. Facilities and Equipment

What is the status of current facilities and equipment available to support VTT? How should these be adapted or expanded to effectively meet future requirements?

E. Course Effectiveness

What processes are in place for VTT course design and development? How effective are current approaches to course development and delivery? How is quality control addressed? How can this be improved in the future?

F. System Development

What current operating procedures and guidelines exist for VTT? How could these be improved? What is the current plan for system development and expansion--technical configuration, uses, audiences, additional origination and reception sites? What options exist? How should needs assessment and marketing activities best be conducted in the future? How should the prioritization of VTT services be addressed?

G. Research

What key research issues should be addressed to facilitate the effectiveness of VTT and the services it offers? How can these issues best be addressed in an operational program?

OBSERVATIONS AND RECOMMENDATIONS

In formulating recommendations the task force was asked to consider the following factors:

- Staffing
- Coordination
- Evaluation, Student Data Collection, Reporting
- Facilities and Equipment
- Course Effectiveness
- System Development
- Research Needs

The task force observations and recommendations are discussed below. These are grouped according to the seven factors selected for study.

General Observations

After reviewing the materials available to them and discussing the VTT program with a broad cross-section of DLIFLC personnel, the task force made the following general observations.

1. The DLIFLC has successfully demonstrated the potential and feasibility of VTT technology as applied to distance learning of foreign languages and has attained a leadership position in this field.
2. Early VTT courses were experimental in nature and involved few sites and course participants. There is an effort underway at the DLIFLC to substantially expand the scope of the program. There is enthusiasm at many levels of the DLIFLC for the expansion of the effort. An expansion of TNET sites has been made possible by a special appropriation in the FY91 Department of Defense budget.
3. The DLIFLC has identified FY92 resources necessary to provide for substantial near-term growth in both course offerings and clients served. DLIFLC teaching and technical support staff have been added to the Distance Education Division to support the VTT program.
4. The DLIFLC is entering a period of transition from experimentation and pilot testing to broader service delivery and institutionalization of the VTT program.
5. Now is the time to build a solid foundation to support VTT delivery of language as an integral part of DLIFLC nonresident program services.

6. The effort to build a solid foundation for the VTT program should commence with a strategic planning process such as that described below.

General Recommendations for Planning

The task force observed that the VTT program is at a critical point as it moves ahead from experimental to operational status. The continued growth and success of VTT is dependent upon the continued commitment of DLIFLC management and field unit support. A carefully defined VTT mission--objectives to be accomplished and planning and implementation strategies to realize those objectives--will facilitate program success. Yet after interviewing many staff at the DLIFLC the task force did not have a clear picture of the VTT program.

The task force recommends that the management of DLIFLC employ a strategic planning process that will guide the VTT program for the next three, preferably five, years. The strategic plan will provide focus and direction to the VTT program staff as they deploy resources to meet VTT objectives.

The strategic planning team for VTT should consist of 25-30 people representing the following: the Command Group; Provost's office; Distance Education Division; National Cryptologic School (NCS) liaison; Faculty and Staff; the School Deans; Department Chairs; Academic Coordinators; VTT instructors; Reserve Liaison; the Program Evaluation, Research and Testing; and other appropriate parties. The team should include representatives from the field units (active, guard, and reserve), as well as on-site coordinators of distance delivery services. Broad representation is necessary for teamwork and to establish ownership and commitment to the VTT program.

The strategic planning team should address the following elements in the planning process:

1. Develop a clear *mission statement* for VTT. This is a broad statement of the unique purpose for which VTT exists and the specific function it performs. This will help the DLIFLC staff focus on the role of VTT within the available nonresident training options, as well as to identify the specific groups to be served. It is important to remember that an organization or program cannot be "all things to all people." Therefore, it is critical to determine the "market niche" of VTT and focus its efforts accordingly.
2. Establish *strategic policies* (parameters). These are management pronouncements that establish the parameters within which the organization will accomplish its mission. In other words, they state what activities VTT will and will not do. For example, the DLIFLC might determine that a VTT course will not be offered at a remote site unless that site has

made a specified commitment to on-site coordination, facilities/equipment acquisition, and release of personnel for training. Or, it might determine that VTT will not be used for initial language training.

3. Assess *DLIFLC organizational strengths*. Identify the characteristics which contribute to the ability of the organization to achieve its mission. For example, one of the strengths of the DLIFLC is that it has a professional, and committed VTT staff.
4. Assess *organizational weaknesses*. Identify the characteristics which limit the ability of the organization to achieve its mission. For example, the institute might determine that there are too few instructional design professionals or technical/engineering staff available to the program.
5. Examine the *organizational structure*. Critique the present organizational structure, which represents the current commitment of resources toward certain objectives. The examination may reveal the inappropriateness of the present structure for the emerging emphases in mission and objectives. The examination would identify such factors as span of control, gaps, redundancies, verticality (layers), and formal vs. informal organization.
6. Evaluate the *competition*. What other organizations attempt to fill the same need as VTT? For example, SCOLA, universities with teletraining programs, or local language programs might be identified as competitors. Determine how this relates to what the DLIFLC is trying to accomplish with the VTT program.
7. Perform an analysis of *external factors*. Examine those forces over which VTT or, for that matter, the DLIFLC has little or no control. For example, the institute might consider the vagaries of the congressional budgeting process, military funding level/process, or changes in military language priorities or force structure.
8. Establish *objectives* for VTT. Express the desired, measurable end results for VTT. It is suggested that the objectives for VTT focus upon outcomes such as student success, performance, and/or achievement, rather than process variables.

Following the efforts of the strategic planning team, action (implementation) teams should be formed for the purpose of developing action plans to implement the strategies. *Action plans* are the explicit portion of a given strategy that outlines the tasks required to implement the VTT program, the person responsible for each task, the due date for the completion of each task, and an analysis of the benefits and costs for the specific action

plan. Completed action plans should be submitted to the planning team for review and approval.

It is suggested that the VTT strategic plan be reviewed and updated annually. This allows changes to the plan to meet new or emerging conditions and assists in maintaining organizational focus.

SPECIFIC OBSERVATIONS AND RECOMMENDATIONS

The following sections present the findings and recommendations of the task force regarding the seven areas identified in the charge to the task force. Both the general observations of the task force and some of the specific recommendations derived from these and other task force findings are introduced under "observations." The task force also discusses approaches or applicable research related to many of the recommendations it sets forth. The "recommendations" of the task force are then listed for each category.

A. Staffing

Observations

As noted earlier, there was a high degree of staff enthusiasm and commitment to the VTT program. This staff dedication and professionalism contributed to the success of the VTT pilot projects. However, a review of the existing VTT organizational/staffing structure during the experimental phases of the program showed that the accomplishment was largely achieved on an *ad hoc* basis. The effort drew upon DLIFLC personnel from the Distance Education Division and other appropriate units--the language schools, Research and Evaluation, Curriculum and Staff Development. Matrix management works well for projects. However, the VTT program's transition from experimental project to operational program status, particularly in light of the envisioned expansion, raises some concerns.

These concerns are centered on the continued ability of the DLIFLC to assign staff to the VTT program, yet maintain high quality performance within particular units in the resident program. No one expressed this more vividly than the academic coordinators who were afraid that the advertised VTT recruitment for 18 language instructors at the time of the site visit might decimate a small language staff in the resident program, thus affecting the quality of instruction.

There are a number of implications for the VTT organization and staffing as the system is expanded. Expansion means increased coordination efforts between remote sites and the DLIFLC regarding training needs, student information, course offerings, course scheduling, site operation, etc. The VTT instructors need adequate knowledge about the current language abilities of the targeted audience beforehand so that instruction can be specifically tailored to client needs. Expansion to include a large array of course

offerings requires modification of existing courseware as well as the development of new courseware adapted to specific training needs and the telecommunications media available with TNET. Course scheduling to fit with both AC and RC training schedules becomes increasingly complex. Since course offerings will be delivered in several time zones, the VTT operational day will exceed the normal 8-hour schedule. Instructor presentations will not always fall within the normal workday and flexible staff scheduling will be required.

Network expansion will require additional technical coordination between VTT and the remote sites to insure a high degree of reliability of service and to minimize down-time. Technical system performance should be of a quality that enhances, not detracts from, the VTT learning experience. Course developers and instructors need to gain greater familiarity with the technical aspects of the telecommunication system. Use of this information can lead to more effective use of the medium for instruction.

Television, as a medium of instruction, is not one in which all instructors can be effective. Teaching is a personalized experience. Many instructors who are very successful in a face-to-face classroom instruction are uncomfortable on camera or do not project well to a remote audience. Instructors, particularly new ones, need the opportunity to practice and receive feedback to determine how they are being received by students. In addition, an evaluation of course delivery needs to be conducted so that corresponding changes can be made, if required.

Finally, the remote-site unit commanders and site coordinators need to clearly understand what the VTT program can and cannot do, as well as their responsibilities and tasks in effectively using VTT services. This will require orientation and training in the requirements necessary to provide a successful student VTT experience.

Staffing Recommendations

The development of a VTT strategic plan already discussed will address many of the potential staffing issues likely to be encountered. The continued commitment of high quality DLIFLC staff is the key to future VTT efforts. As the DLIFLC examines the organizational and staffing requirements for an expanded VTT effort, the task force recommends the following:

1. Examine the existing VTT organizational structure to identify additional staffing required both at the DLIFLC and remote sites to support an expanded VTT effort. This examination should take into account a planned, incremental expansion that does not overburden existing staff and cause a decline in VTT (and resident DLIFLC) program quality. The organizational structure(s) should be designed to avoid staffing gaps and redundancies.

2. Consider converting two of the 18 new VTT teaching positions into positions dedicated to the tasks of: (a) clear articulation of an enhanced VTT curriculum and instructional design process, and (b) teacher training and other necessary staff development both at the DLIFLC and at the field sites.
3. Provide for the inclusion of flexible, individual work schedules in the staff utilization plans, since many of the VTT program course offerings will not fall within the normal 8-5 workday.
4. Obtain additional engineering and technical assistance staff, on either a contractual or permanent basis, to maintain the expanded VTT system at an acceptable performance level, e.g., 95-99% reliability.
5. Consider the impact of VTT staffing demands upon the resident programs. Assuming that 18 instructors were recruited from the existing resident program, the impact, at first glance, would not appear to be great (approximately 2%). However, the impact could be significant upon certain programs, e.g., a small program with few faculty or high-enrollment languages with heavy teaching requirements.
6. Plan and provide a careful program of staff development for DLIFLC course developers, instructors, field coordinators, technical staff, managers, and other VTT staff.
7. Provide an orientation program for DLIFLC staff and field unit personnel who are not familiar with the VTT program. This program should address the effective development of VTT and its role in language training.
8. Pay careful attention to appropriate staff recognition and rewards since extra time and effort are often required for course development and instruction.

B. Coordination

Observations:

The staffing approach for VTT at the DLIFLC includes drawing upon staff from both the Distance Education Division and from other appropriate units (e.g., schools, Research and Evaluation, Curriculum, Staff Development). The present approach requires *matrix management* of staffing resources (i.e., an approach in which staffing is determined and assigned based upon VTT program needs, but where staff are largely supervised by an external chain of command). A great deal of emphasis must therefore

be placed upon staff coordination. A concurrent emphasis on coordination with current and potential clients is also essential to VTT success.

Coordination Recommendations:

The task force therefore recommends that the following items be addressed under the heading of coordination:

1. Formal agreements should be put in place to assure that contributing DLIFLC units both understand and agree to perform the tasks required to make VTT a success. Once these agreements are in place they should be carefully monitored by management to assure that tasks are being performed as scheduled and that the agreements are fine tuned or modified as needed.
2. Effective communication among the various DLIFLC VTT program participants is essential to success. To that end, it is suggested that there be regular VTT management meetings incorporating representatives from affected DLIFLC organizational units, and that focused team meetings (e.g., course design, course development, network expansion, course scheduling) be regularly held to address specific, ongoing facets of program implementation.
3. Procedures should be established to assure the timely and effective flow of essential information among DLIFLC units and staff. It is suggested that procedures be established to report information such as course design procedures, course development needs, course scheduling, evaluation, course participation, technical developments, network expansion, etc.
4. Effective user involvement at all levels is essential to VTT success. This should remain a high priority for staff from the Distance Education Division. It is suggested that field involvement be obtained during all phases of project implementation, including planning, site development, course selection, course scheduling, data collection and reporting, etc.
5. Formal agreements should be established with the remote VTT classroom sites which specify in detail the requirements for establishing and equipping each site, site operation, course scheduling and attendance, data reporting, staffing, etc. Site operation and course administration procedures and guidelines should be provided to all participating sites.
6. Procedures and guidelines should be established for effective communication and reporting to field participants. It is suggested that information about the VTT program be routinely provided to all potential

VTT participants through items in standing DLIFLC publications. Furthermore, a VTT newsletter should be developed and distributed to all current and scheduled participants to keep them informed about VTT developments, results, and course offerings. The outcomes of course participation should be routinely reported to participating units and students.

7. An emphasis upon customer satisfaction should be stressed in dealing with the participating VTT sites. Attention to user needs, responsiveness, and an attitude of constructive problem-solving should also be stressed.

C. Evaluation, Student Data Collection, and Reporting

Observations

During the past fiscal year a comprehensive external evaluation of computer-assisted study (CAS) and VTT courses was conducted by IST (see Bramble and Bauer, 1992c). The evaluation identified areas for improvement and fine tuning. The DLIFLC has implemented a number of changes based upon these recommendations, and the usefulness of evaluation and feedback was demonstrated by this effort. Even for the aborted Team Spirit training scheduled for Fort Lewis in 1991, evaluation data provided a basis for correcting system problems and assisted in the improved performance of the VTT system in future pilot test courses. However, current plans for ongoing evaluation, data collection, and reporting are quite modest and should be expanded as VTT instruction moves from experimental to operational program status.

It was clear from the task force interviews with DLIFLC staff at all levels that personnel involved in VTT were very concerned about successful course *delivery*. They seemed less focused on evaluation of the *instructional effectiveness* of the courses. Focus on delivery may be appropriate in an experiment designed to test the efficacy of hardware and basic concepts. However, as the program moves to a more established basis, the courseware will require constant upgrading and servicing. During the developmental phase of each VTT course, evaluation should be a routine step. An external review of the program should be conducted on an annual basis. Internal and external evaluations have different purposes and capabilities. The task force believes that routine VTT evaluation requirements would be best conducted internally to provide quick turn-around for corrections. The objectivity and perspective of an external program evaluation would then be obtained on an annual basis to provide input for program modifications as the effort grows. The following deals more specifically with the evaluation, student data, and reporting essential to maintaining VTT course quality.

Overall design of the evaluation. The design of evaluation typically begins with a purpose for the evaluation or a set of goals. These purposes may involve any or all of the following:

- Establishing a basis for policy and decision making
 - Assessing student performance
 - Determining the efficacy of curriculum content
 - Approving courses and delivery systems
 - Monitoring fund expenditures
 - Improving existing educational programs
 - Advising program management and staff
 - Judging adequacy and reliability of delivery systems
- (Adapted from: Worthen & Sanders, 1987)

The design of the evaluation of an educational program usually begins with a consideration of course objectives and general course design. Based on these objectives and other course design factors, specific measures and observational data are used to determine whether or not, and to what degree, the instructional programs were successful. Evaluation may also be designed to incorporate questions about the effectiveness of the project's planning or development phase. In the case of VTT, other suitable areas for evaluation are equipment performance, signal reception and reliability, staff training, scheduling, and course management at local sites, to name a few. Political, economic, and other contextual realities are also frequently considered with an evaluation. For example, it is probably worthwhile for the DLIFLC to identify internal and external "political contexts" for VTT (e.g., regarding resident vs. non-resident language preparation, AC vs. RC student participation, etc.).

The individual lessons in the pilot studies were well-received according to the results of the pilot test evaluations. However, from an instructional point of view, there was no instructional design model guiding the course development process. This omission may have been due to the experimental nature of the effort and the focus on evaluating the delivery system. A more clearly specified design model could have contributed to enhanced course effectiveness and made possible a more thorough evaluation.

Responsibility. Evaluation efforts require a direct DLIFLC personnel investment and clear assignment of responsibility. This will assure that the evaluations are appropriately focused and effective. The expertise to carry out internal evaluation functions for the VTT currently resides in the DLIFLC Evaluation and Research Division.

Data Collection and Reporting. The task force was told at the time of the site visit that little or no VTT student or course data were currently maintained. Remote sites did not routinely send a record of attendance, registration, scheduling, or student characteristics to the DLIFLC upon course completion. It was therefore difficult for the

DLIFLC to document the effectiveness of its distance offerings. For example, if there were an interest in determining the relative effectiveness of print versus VTT delivery of specific learning material, it would even be difficult to document participation, let alone performance implications. Rates of completion of the course material by students were likewise difficult to document.

In addition, little or no feedback was provided to students about their overall performance in VTT training other than that received from the instructors during the teaching of the courses. Some of the teachers to whom the task force spoke expressed concern about what was actually being received in the remote classrooms and how effective the instruction was. Evaluation of VTT instruction must recognize the ergonomic differences in the common interaction between teacher and student in VTT versus resident classrooms. In VTT, the technology filters out part of the qualitative interaction between teacher and student which communicates the effectiveness of the learning experience. Data collected about the courses can provide teachers needed information about students' progress. The nature of those data should be carefully defined to provide effective feedback to students and instructors as well as to those working on lesson development.

Teachers expressed concern that they had little information about the students or their language learning needs and capabilities prior to the VTT broadcasts. They were sometimes surprised by the initial student skill levels and the heterogeneity of language skills in the classes they were assigned. The task force suggests that a student registration form be used to gather student data prior to course delivery and that the information be entered into a database. A summary of the registration information could then be made available to the VTT developers and instructors to enable them to appropriately target the instruction. Each student who registers for a course should, depending upon the nature of the course, be given a short assessment or diagnostic test to obtain information needed for the instructional process. In addition, it may be that some limitations need to be placed upon the degree of heterogeneity of student skills in VTT courses for the resultant instruction to be effective.

In conclusion, evaluation is necessary for maintaining course quality as the VTT program becomes more established. The evaluation should take into account the instructional design and the stated objectives for each course and the overall program. Given proper data records, it would be possible to develop a database that would permit the DLIFLC to test delivery models and strategies and to conduct research to adjust course offerings on such dimensions as class size, proper methodology for VTT classroom activities, and pre- and post-broadcast classroom activities. In addition, occasional small-scale, controlled studies could be conducted to assess instructional strategies, e.g., off-line practice configurations that would maximize the VTT experience. Given the above, students and faculty would mutually benefit from the enhanced information that would be available. The specific task force recommendations related to evaluation, student data collection, and reporting are presented below.

Evaluation, Student Data Collection and Reporting Recommendations

In view of the observations described above, the task force recommends that the following actions be taken:

1. Consistent with the task force's emphasis upon course data collection, a registry of information about students should be obtained prior to beginning the delivery of a course. This should include MOS, Defense Language Proficiency Test (DLPT) scores, summary of prior training, and perceived unit and individual training needs. When a VTT course is completed, attendance records, achievement data, and course ratings should be added.

Basic data collection schemes do not have to be elaborate. For example, a simple student registry could be designed. Into this registry, basic data about students would be entered when students register for a course at the local site. This could be done using printed forms or a relatively simple computer database application developed for this purpose. At the end of each course, the local site coordinator would be responsible for adding: (1) student attendance data and (2) pre-test scores and post-test scores. The data could be sent to the DLIFLC in hard-copy form, on a computer diskette, or it could be transmitted electronically. Course rating forms could be sent via U.S. mail to the DLIFLC for processing.

As a minimum, the student registry should include the student's name, social security number, MOS, previous language course(s) and date(s), most recent DLPT scores, and the date of testing. Other information might be included on a sampled basis for the purpose of addressing specific evaluation questions. For example, course developers might wish to determine whether inexpensive audio tapes could augment VTT in listening exercises. A limited study would be facilitated by flexibility designed into the data system to incorporate data relevant to this issue.

2. To assure that the ongoing evaluation activities are properly managed and conducted, an individual or existing office should be assigned to assist the VTT program. This person or office would represent the evaluation perspective in ongoing project activities, and be responsible for designing and managing the overall evaluation effort. The evaluator should have the required expertise (i.e., research and evaluation methodology, language instruction, curriculum design, etc.) to assist development teams to specify measurable objectives, construct questionnaires and achievement tests, and define specific data and reporting requirements.

3. Consistent with the findings of Clark (1989), questions about the *delivery system* vs. the *instruction provided* should be treated separately when evaluating VTT courses. In addition to more general assessments of the VTT courses, teachers and students can benefit from specific diagnostic pretests designed to measure skill levels and identify areas for training emphasis prior to beginning a VTT class.
4. Data regarding attendance and performance should be gathered and retained at both the student and course levels. Using these data, two types of report cards should be prepared by the instructor/course coordinator. A report card which summarizes unit performance should be sent to the unit. Additionally, each student should receive a report card reflecting individual performance and suggesting areas and instructional materials for follow-up study.
5. The above data and other information provided by the site coordinator should routinely be made available to course development teams to assist in decisions regarding course offerings, training needs, course scheduling, and course improvement.
6. An annual external evaluation of the VTT program should be conducted in order to determine progress and assist in the refinement process. The evaluation design should reflect the concerns of the various participants in the VTT program and be carefully guided by an assigned representative of the DLIFLC Evaluation and Research Division.

D. Facilities and Equipment

During the task force site visit, task force members toured the current VTT course origination studios and observed portions of an inservice course for contract language teachers at a remote site. Task force member William Thomson interviewed the DLIFLC Facilities Manager, Mr. Jerry J. Abeyta, to obtain information about plans for future facilities acquisitions to meet expanding VTT requirements. The following are Mr. Thomson's observations and the task force's recommendations regarding facilities and equipment for the VTT program.

Observations

Existing DLIFLC facilities were pressed into service for the experimentation and VTT pilot efforts. These facilities--teaching studios--consist of what was originally the post's television studio and a wooden annex (original use unknown). Technical equipment used to provide the two-way video, audio and graphics transmissions are supplied by the AETD under a contract with Oklahoma State University. The equipment is standard for TNET sites throughout the network. It is locally operated and maintained

by a contractor to the DLIFLC for media services. The equipment consists of Compression Laboratories' Rembrandt II Gallery® (a codec, two 35" television monitors, a video camera, a graphics transmission unit ("ELMO"), a managing computer, a switching unit, and an uninterruptable power supply for each studio). A recent addition (July 1992) is a "multimedia computer" with graphics software that can be used to produce, store, and send digitized instructional graphics (and other images) over the system. Ku-band satellite transmission equipment and a satellite dish are also provided for each studio. Furnishings consist of tables and chairs and a simple backdrop (office partitions).

The two studios used at the time of the site visit can best be described as makeshift, suitable for experimental pilot projects, but not suitable for permanent use without substantial modification. Problems identified by the instructors and course coordinators included: lack of materials and preparation space; difficulty of access to the studios before broadcast time; and access to break room/restroom. Teacher time was wasted at these facilities simply because needed equipment, supplies, and service facilities were located in other campus buildings.

At the time of the site visit, the DLIFLC Facilities Management representative reported that the institute had planned the remodeling of an existing wooden building near the Distance Education Division Office to include six studio/classrooms and related spaces to meet the needs for the expansion of VTT. However, the DLIFLC Facilities Management representative indicated that this remodeled facility (when completed) should be considered temporary housing, not a permanent solution to facility requirements for the VTT program. As of July 1992 the renovation appears to have been postponed and the additional VTT studios installed in this building are again makeshift.

A review of the DLIFLC facilities acquisition schedule, 1991-96, with Facilities Management did not show a planned acquisition for VTT. There was, however, an A/V Media Center included for 1991. This facility had been originally planned in 1983. The plan called for a remodeling of the existing television studio and related spaces, the removal of the existing wooden annex (VTT studio II), and the addition of a two-story, 38,000 sq.ft., A/V Center. The original purpose for the audio/visual center has apparently been overtaken by events. This may afford the DLIFLC an opportunity to plan an alternative facility to accommodate current and future distance delivery programs that include VTT.

Although the task force did not visit remote site classrooms, observations that they made during a VTT course in progress, as well as evaluation data gathered for the VTT pilot projects, indicated a need for improved remote classroom facility standards and equipment requirements. The remote classroom observed by the task force via VTT was cramped and the students were not paying full attention to the instruction. The pilot program evaluations included student complaints of difficulty in concentrating on VTT instruction over extended periods of time.

Elements of the physical environment that most often affect student attentiveness and concentration are lighting and heating, ventilating, and air conditioning (HVAC). Foot candle power that is too strong creates glare, while weak candle power affects ease in seeing what is being presented instructionally. In either case, the result is eye strain, which (coupled with the constraints of compressed video images) can become excessively tiring over extended periods of time.

Improperly regulated HVAC causes student discomfort because of stale air or room temperature that is too hot or too cold. Human bodies and equipment both generate heat that needs to be rapidly dissipated. The problem is exacerbated if people and equipment are crammed into an inadequate space. Appropriate lighting, HVAC, and space standards are required for studios and classrooms. The task force has reviewed a set of standards recently developed for TNET classrooms by the AETD and considers them generally adequate. However, these standards should be reviewed periodically as they are put into use.

Instructors also noted that remote classrooms in the pilot tests did not have ancillary equipment, such as copiers and fax machines, needed to facilitate course delivery. The availability of this equipment should be verified prior to instruction.

Many remote sites (potential customers) that would avail themselves of VTT programs do not have the equipment for two-way compressed digital video presentations. However, some may be equipped to receive full-motion analog video and two-way audio (via satellite and phone-lines). The DLIFLC might consider providing selected programming to these sites that could be received using their available communications equipment. However, to do this, the institute would need to develop or lease the necessary studio resources and the capability to uplink an analog signal.

Finally, it is well established that telecommunications technology changes rapidly. Equipment for the TNET sites is leased by the government rather than purchased. It is anticipated that the current equipment used in the studio/classrooms will be replaced by the AETD with more advanced, state-of-the-art equipment in 18-24 months. Equipment development and obsolescence is an endless cycle in a very competitive industry. This should not deter the DLIFLC from continuing its efforts with the current TNET technology. However, the physical plant must have the built-in flexibility to accommodate these future technological changes.

Facilities and Equipment Recommendations

Given the observations above, the task force makes the following recommendations regarding VTT facilities and equipment.

- 1 Plan to acquire permanent facilities to house VTT instructional studios and related support spaces. Support spaces should include a practice studio,

tape library/storage room, technical equipment repair room, instructor work and break rooms, audio taping studios, tape duplicating room, and related restroom, circulation, and mechanical spaces.

2. To alleviate coordination problems, explore the feasibility of housing the VTT program in a larger distance education facility. This would preferably accommodate management and support staff as well as have the technical facilities required for course transmission.
3. Facility flexibility needs to be addressed in the planning process. Where new construction is planned, adaptability and flexibility of interior spaces is essential to accommodate changes in teaching/instructional models and technological obsolescence. For example, space flexibility and advances in video/audio transmission technology and equipment can be provided for by specifying that a grid system, planned on a modular basis, be provided with access to electrical power and signal lines. (Proper placement of conduits will allow easy access to electrical transmission lines--satellite, fiber optic, twisted-pair wire, coaxial cable, etc.) The grid system should provide independent lighting and ventilation control within each module. Special attention should be paid to existing requirements and exterior light panel placement. In other words, the integration of building systems is essential if the institute wishes to reconfigure interior spaces at minimal expense at some future time.
4. To insure that the physical environment enhances, rather than detracts from, instructional and related activities, develop a set of educational specifications to state the detailed requirements of the program and occupants. Educational specifications are then given to the architectural design professionals at the beginning of the facilities design process. At a minimum, educational specifications should include the activities to be conducted within each space; the type, size and number of spaces required; the required relationships among spaces; and the physical amenities of each space. An example of a partial educational specification is attached as Appendix B for reference.
5. Given the feedback from the VTT pilot tests and in light of item 4 above, criteria for physical and equipment requirements for remote site classrooms should be reviewed and refined.
6. To maximize student learning opportunity/performance, each remote classroom site should acquire equipment and furnishings as well as provide the physical space as specified by AETD and DLIFLC. These specifications should be a requirement for remote site participation.

7. The DLIFLC is held in high regard by remote sites as a provider of high quality services. In order to continue the success of VTT and maintain quality performance, a high priority should be placed by AETD and DLIFLC on correcting any current network and site technical problems. The DLIFLC should establish and maintain high standards of network performance and reliability.
8. Explore the feasibility of equipping one instructional studio to transmit one-way, full-motion video to reach a large number of additional sites already equipped to receive this type of transmission. This should be considered an experimental portion of the VTT program.

E. Course Effectiveness

Observations

Course effectiveness can be determined along a number of dimensions. Indeed, it has already been shown in pilot studies that VTT training can be effective on some of these dimensions. For example, it has been shown that (point-to-point) language instruction can be delivered from the DLIFLC to a single remote site by DLIFLC staff via TNET technology. Success on other important dimensions has yet to be demonstrated. Among these dimensions are such important issues as point-to-multipoint uses of TNET, cost effectiveness of alternative instructional design models, media options for meeting specific instructional objectives, student learning and performance under different instructional design options, variations in teacher skill and ability within the VTT environment, and capacity of the equipment to facilitate specific language learning activities, to name a few. The relative importance of these dimensions should be reflected within an overall VTT *instructional design plan*.

A wide range of opinion exists at the DLIFLC concerning the nature of appropriate design, development, and delivery strategies for VTT courses. Course ratings by participants in the pilot tests were generally positive, but suggested some areas for improvement. To date, efforts to design VTT courses have been largely *ad hoc* and each course offered on the VTT appears to have been designed from the ground up. For the pilot tests no evidence of an overall instructional design could be discerned. As course offerings increase, more systematic procedures will be required, including enhanced instructional design and formalized staff assignment, staff training, and support staff involvement. Perhaps, following the recommendations of the resident program task force (see Bramble and Garrett, 1992) instructional *templates* (in this case templates for VTT instruction) could be developed to assist teachers in various aspects of course development.

While it is recognized that the DLIFLC has taken the lead in the design of effective language instruction world-wide, language instruction by VTT is a new arena

for which an established theory of instruction has yet to be demonstrated. Further, different goals for language training may call for different instructional designs. The DLIFLC finds itself on the cutting edge of a major development to provide effective language instruction to students at a distance where many key tools remain to be designed. Following the method of the resident program task force documented in Bramble and Garrett (1992), the nonresident program may wish to convene a panel of nationally recognized language learning experts to address the VTT instructional design issue. The following discussion focuses on the development of an instructional design plan for VTT.

1. Instructional Design Plan

One of the key characteristics of effective distance education programs is that courses are carefully designed and planned. (See Bramble, 1990c.) Such design can take the form of less formal lesson planning to more formal instructional systems design (ISD) procedures. While many language educators tend to reject formal ISD models on the grounds that they do not adequately address the needs of proficiency-oriented language instruction, the task force feels that careful instructional design procedures and formal ISD models should be given further consideration by the DLIFLC. Common components of instructional design, derived by Andrews and Goodson (1980) after reviewing over 40 models of instructional design, include the following:

- Assessment of need, instructional problem identification, occupational analysis, competence, and training requirements
- Formulation of instructional goals and objectives stated in observable terms
- Analysis of goals for types of learning/skills required
- Sequencing goals and subgoals to facilitate learning
- Characterization of the learner population
- Formulation of system and environmental descriptions and identification of constraints
- Consideration of alternative solutions to instruction
- Formulation of instructional strategies to match subject matter and learner requirements
- Selection of media to implement strategies
- Development of courseware based on strategies
- Development of a pretest and post test matching goals and objectives
- Empirical tryout of courseware with learner population, diagnosis of the results, and courseware revision
- Development of materials and procedures for installing, maintaining, and periodically repairing the instructional program
- Costing instructional programs

These general components of instructional design appear to have direct applicability to the DLIFLC VTT course design and development process. Further,

Martin (in press) summarizes the work of Bramble (1990c), Cyrs (1990), Gibson (1985), Jorgensen (1986), and Moore (1990), regarding principles of ISD related to distance learning. The common principles she identifies also appear relevant to VTT course design. These principles are as follows:

1. Distance learning requires better planned learning activities, strategies, and media than are required for platform instruction.
2. Distance education programs should be developed using a systems approach including assessing needs, planning strategies, designing objectives, organizing objectives, and evaluating results for redesign.
3. Students need to be taught how to learn from a distance learning system.
4. Meaningfulness must be established for the learning tasks.
5. Learners must have the necessary prerequisites for learning to occur. This will add to their motivation and to their success in the learning environment.
6. Communications, presented either by a live instructor or by technology, must be clear and specific. Learning objectives should be clearly stated, important relationships should be shown, and demonstrations should be explicit.
7. Instruction should be active with opportunities for learners to respond.
8. Practice should be distributed over time.
9. Instruction should be presented in short segments.
10. Distance delivery systems that use a variety of media or a total learning strategy approach are most successful.
11. Feedback and reinforcement are essential to successful learning. Alternative routes to reach objectives are desirable.
12. Students need a "mindset" for instruction, e.g., an introduction, an advance organizer, etc., so that they know precisely what to look for during the instructional activities.
13. Structured notes or outlines of the content should be provided to guide the students through the content that is covered during instruction.

14. Opportunities should be provided for the learner to interact with the teacher, other students, and the instructional materials.
15. Developers should humanize the instruction by creating an environment that breaks down interpersonal distance and facilitates rapport between all the participants in the program--instructor, students, and site facilitator.
16. Instructional materials should be pilot-tested and validated prior to use.
17. Instructors and site facilitators need training in how to facilitate student learning in a distance education environment and how to use the technology.
18. A design team, including the instructor, a media specialist, and instructional designer should work together for the academic integrity and instructional quality of the final product.

A key aspect of instructional design for VTT is the selection of appropriate media for the identified learning activities. Levie and Lentz (1982) provide a summary of research into media selection which should also be helpful in developing the overall design of language instruction via VTT. They discuss the appropriate roles of illustrations, graphics, audio/visual media, television, and interactive television.

There was a consensus of opinion (task force members and many DLIFLC academic staff) that a careful design and development process will need to be adopted for VTT instruction, but no clear agreement on the nature of this process. A recent DLIFLC publication, *Video Teletraining Strategies* (DLIFLC, 1992), offers valuable guidance for lesson planning and instruction for VTT courses. However, it does not provide a formal model for course development nor an overall instructional design. Little additional guidance for the development of language instruction is available in the distance education literature, with the possible exception of Davis (1988), who stressed the need for high levels of interactivity in distance education courses targeted at higher foreign language proficiency levels. Likewise, there is no specific guidance in the literature regarding the effective incorporation of computer-assisted study segments into VTT language instruction.

The physical appearance of an instructional design is variable. Some designers find a matrix of course objectives by media and delivery options (e.g., VTT, CAS, audio tape, print, etc.) sufficient. Other designers use tables and flow charts. (See Gagné, 1985.) An instructional design may consist of a narrative describing scope, sequence and goals, and lists of objectives with sub-objectives for each lesson. It may use tables articulating the objectives by lesson activities and media alternatives. In addition, points for student performance assessment and specifications for assessment procedures may also be included. The purpose of the instructional design is to guide course development, and

it should be developed before lessons are prepared. As with other kinds of instructional technology, the two-way video, audio, and graphics capabilities of VTT provide a specific array of media options available for instruction. By recognizing and capitalizing upon the unique strengths and capabilities of the VTT technology, the effectiveness of the VTT courses can be optimized and supplemented where needed with other media or on-site instructional activities.

A complete VTT language course often incorporates the use of print materials, workbooks, and written exercises for students, and may also utilize videotaped materials (e.g., excerpts from SCOLA programming, specially prepared video segments), audio tapes, simulation or role playing, recitation, CAS exercises, etc. Each media alternative has specific strengths and weaknesses for delivery of instruction and these need to be planned for and recognized in the design process. A major value of VTT is that it makes possible a high degree of interaction between the instructor (often a native speaker of the language) and students at a distant location. Through this interaction the students can get immediate feedback and correction for pronunciation and expression. VTT also provides the opportunity to integrate graphics into instruction in pedagogically significant ways. For example, graphics can be used to present advanced organizers to prepare the students for vocabulary, phrases, or idioms they hear during the lessons. However, as the DLIFLC has found, highly animated video is not desirable because it appears blurred when transmitted in the compressed digital format used with TNET.

VTT can also be effective in bringing together for language training a group of students who are in multiple, distant locations but who are joined together for this purpose. The DLIFLC has been reluctant to explore the applications of point-to-multipoint communications to language training because of the high requirements of interactivity in much of its VTT language instruction. However, these applications should not be entirely dismissed and should be explored from the points of view of efficiency, cost containment, and enhanced learning opportunities. Also, the distribution of pre-taped VTT instruction (arguably less effective due to the loss of spontaneous interaction) should be explored for some applications (e.g., reviews, advance organizers for classes, factual presentations, etc.).

Learning style and other student characteristics may be important in facilitating student success in learning language via VTT. (See Keesling, Lett, and Thain, 1992.) Students may approach the learning process in different ways. A number of DLIFLC staff commented on this point during the task force visit. An instructional design should provide a richness of alternative experiences within a program using supplementary materials, classroom exercises, and media options for small-group and individual learning. These exercises and experiences can be designed to accommodate a variety of effective learning strategies within a single class. Again, coordinating this portion of the design effort with course evaluation will lead to better information being provided to students, instructors, and planners charged with course maintenance and effectiveness.

2. Management Plan for Instructional Design

An instructional design management plan should identify critical time lines, staff requirements, resource allocations, milestones, and evaluation points within the development and implementation phases of instruction.

On a general level, key personnel from the DLIFLC schools suggested that course selection needs to be determined by both (user) demand and (DLIFLC) supply side considerations to insure that the DLIFLC can build on its strengths and yet maintain a high level of quality in both its resident and nonresident course offerings. To avoid continually reinventing the wheel and to better delineate who should be enrolled in the courses, staff from various sectors of the DLIFLC suggested that a specified set of VTT courses be developed and a *catalog* of VTT offerings could be distributed to the field. This catalog would describe the available courses and identify students prerequisites for participation. It was generally accepted among the DLIFLC staff that VTT could not be expected to do all things for all people in language training. The staff suggested that some of the demands that might be placed upon VTT by the field might be naive or unrealistic and even beyond the capability of intensive resident training programs (e.g., provide training taking students from 0+ to 2+ in speaking in a two-week intensive course). Such unrealistic external demands might be made because of a lack of sophistication or appreciation of the process of language training. In this regard the task force felt that a catalog of offerings might not only serve to delimit the expectations for VTT course outcomes at realistic levels, but would also be of additional value in allowing the DLIFLC to focus sufficient instructional design resources on courses or course segments that are *reusable* (and for which the higher instructional design costs can be reduced through amortization).

A further recommendation for the management of course development emerged from various discussions at the DLIFLC. A *phased development* of course offerings based on prioritized user needs appears to reflect the collective wisdom of a number of the discussion groups. DLIFLC staff felt that it may not be an effective use of available resources to develop a large number of VTT courses simultaneously. The process of instruction using VTT is new and not yet fully understood. Many questions regarding how the technology would be effectively applied in language learning have not yet been recognized or articulated. This being the case, the task force recommends a strategy of phased course development in which certain courses are systematically developed and carefully evaluated and the results of these evaluations would be applied to course development at subsequent stages. In this way adequate resources could be assured for course development at each stage of the process and course quality can continue to improve over time.

It was clear from the discussions with current and former VTT instructors that they consider VTT instruction to be a very different process from traditional classroom teaching. Valuable lessons have been learned by these VTT instructors and their

supervisors. Although the level of enthusiasm expressed by the experienced VTT instructors was generally high, some instructors felt (as one might expect) that they were more effective or more comfortable on the VTT than did others. Furthermore, most VTT instructors stated that, because of the differences in VTT vs. classroom teaching, carefully designed teacher training is needed as a prerequisite for effective VTT course development and delivery. The DLIFLC publication, *Video Teletraining Strategies* (DLIFLC, 1992), offers substantial insights into VTT lesson planning and delivery and is judged by the task force to be a useful resource for instructor training, though additional materials are needed. Because of the unique demands of VTT courses at the remote classrooms, additional training in instructional management would also be helpful for receiving site personnel who support VTT course delivery.

Instructors and supervisors expressed concern during the site visit about how they would know or become informed about the quality of the VTT instruction they were giving. There appear to be few formal mechanisms in place for feedback to the instructors about course effectiveness or student progress. Ongoing course evaluation procedures can address some of these concerns. These procedures should be identified in the management plan, and should target factors deemed of specific concern. For example, as recommended earlier, local receiving sites might be asked to maintain attendance records. Also, logs kept at the remote sites might assist in studies of equipment or signal reliability. To insure course effectiveness, additional student data collection will be necessary as well. A prior section of this report discusses the need for collecting, storing, and reporting specific types of student data. In addition to these kinds of continuing data efforts, milestones within the course development and implementation plans should be identified for types of data reporting. For example, formative evaluation data concerning course components can be reported during course development and delivery to assist in making changes in instructional design.

3. Studying Course Effectiveness

Studying the effectiveness of courses is a deceptively difficult enterprise. It has already been demonstrated that existing VTT technology can be used by the DLIFLC to deliver certain categories of language training. Future effectiveness questions might be posed regarding: the relative costs of various VTT course designs when compared to other forms of instruction; the preferred role of VTT within the nonresident language training program; the kinds of learning facilitated and/or hampered by VTT courses; and the quality of student learning in VTT environments. Of the various measures by which effectiveness can be addressed, the effective assessment of the quality of student learning may be among the most difficult. The quality of educational interventions is always difficult to ascertain. In the DLIFLC context, the meaning of instructional program effectiveness as tied to the dual demands of language proficiency and aspects of the military mission render the assessment of course quality even more complex.

The measurement of effectiveness using pre-post test differences can also be difficult due to the limited reliability of test scores and the small numbers of students within most VTT classes. One strategy might be to document the rate of deterioration of language skills over time once a student leaves DLIFLC resident training. (See Lett, 1990, O'Mara and Alexander, 1992.) Effectiveness might then be studied from the perspective of the mix of language training available to given sets of soldiers (including VTT). Training success might then be based upon a measure of the reduction in the rate of language skill loss or enhancement over time given a set intervention. Attractive as this notion might be, language skills are numerous and varied. Abbreviated measures that reflect the totality of language performance (e.g., as measured more fully by the DLPT) are difficult to construct. Analysis of specific skills taught in the courses (e.g., listening, speaking, reading comprehension) appears more straightforward for short-term studies.

Course Effectiveness Recommendations

Based upon the observations and considerations just presented, the task force recommends the following:

1. An overall instructional design should be developed for VTT language instruction. The design should reflect the purpose for which VTT instruction is being used (i.e., refresher training, remediation, military skill training, instructor training, etc.), the broad goals and objectives of the instructional program, sub-objectives and lesson objectives, utilization of media options within lessons and study materials, lesson length and format, and other relevant information for course developers. In this regard the Distance Education Division staff at the DLIFLC may wish to review documentation IST is preparing for TNET course development in the Florida Teletraining project (see Martin, in press.)
2. An instructional design and curriculum development effort should be mounted specifically for VTT instruction that recognizes the differences, capabilities, and challenges inherent in this approach to distance education. It should be recognized that VTT is a unique form of instruction which places specific demands on various course components. While segments of the existing resident and nonresident programs may be utilized or adapted for use within VTT courses, these materials should be identified only after the instructional design is established and the materials can be identified for a specific purpose. Course development should involve participation by resident curriculum personnel and teachers. Martin (in press), as well as Cyrs (1990) and Ostendorf (1992), contain material regarding effective telecourse design.

3. In order to successfully implement VTT, a small number of courses should be initially prepared based on identified MI unit needs and DLIFLC institutional capacity. This core group of courses can then be gradually expanded as experience is gained in preparing and offering VTT instruction, and as needs are further articulated by the target populations. This would suggest developing an evolving catalog of expanding course offerings that would be made available to users.
4. To enhance course effectiveness and assist the effort to develop reusable course elements, a student guide and site coordinator's manual should be developed for each course. The student guide and coordinator manual should both explain course procedures and include all relevant hard-copy course materials. Examples of these will be found in the courseware the Florida Teletraining project is now developing for three MOS-producing courses for the U.S. Army.
5. Provision should be made for continuous assessment of client needs and the effectiveness of VTT courses in addressing those needs. Such assessment would include information about individual and unit language training requirements, specific course components, and resources needed to address these requirements.
6. Students and field units should be routinely asked to comment on the effectiveness and quality of the instructional and technological components of VTT courses.
7. Careful consideration should be given by the DLIFLC to the differences in the design and procedures for VTT courses for AC vs. RC personnel.
8. For reasons of economy, consideration should be given to instruction that can be offered via point-to-multipoint networking (e.g., more generic training) as compared to instruction that requires strictly point-to-point communications (e.g., instruction focused on more advanced speaking skills). (For a discussion of generic training see Garrett's paper on grammar instruction in Bramble and Garrett, 1992.)
9. Site managers should be required to keep continuous logs of classroom events as courses are being transmitted/received (e.g., audio loss, video problems, interference, local classroom disturbances, power difficulties, student attendance as affected by drills, alerts, etc.) in order to better interpret the observed results of VTT courses.

F. System Development

Observations and Recommendations

Current VTT plans include an expansion of TNET origination and remote classroom sites, an increase in course offerings, and an effort to institutionalize both the organizational support structure and the recurrent resource requirements of the program. Thus the program is in transition from a small-scale experimental effort to an operational program of some scope. DLIFLC staff at many levels have been addressing key elements of this transitional process, but at the time of the site visit, there was no clear, step-by-step plan in place to guide this rather substantial change. A clear plan is needed for successful system development. In this section the task force presents recommendations for system development including such factors as management, planning, and organization. The recommendations are consistent with many of those discussed under strategic planning previously. Facilities and equipment issues were discussed in section D above.

The task force makes the following recommendations for system development:

- Users need to know what to expect from VTT course offerings. This can be made explicit through publishing a phased development plan. Such a plan would assist in maintaining the credibility of the DLIFLC teletraining program by not disappointing clients' expectations. The development plan should be consistent with the institute's ability to deliver a quality product within available resources.
2. The VTT effort should not be developed in isolation from other DLIFLC language programs, media, and delivery systems. Appropriate DLIFLC instructional materials should be adapted for use in VTT courses, where possible. Cost-effective use of existing on-site language program resources integrated within the VTT instructional design should be explored. Further, an assessment should be conducted to determine the feasibility of linking VTT course delivery to alternative existing networks (both military and civilian).
3. A strategic planning effort should be mounted to establish a *clearly articulated mission* for the VTT program within the broader mission of the DLIFLC. The importance of the task force recommendation that the DLIFLC establish a strategic planning team is reiterated here. The planning team should develop a clear mission statement and measurable goals and objectives. It should identify a set of strategies to implement programs to meet the goals and objectives. Further work would provide

operational plans for these strategies, and establish accountability with acceptable performance criteria.

G. Research

Observations and Recommendations

It was the task force's opinion that there are a number of areas requiring further research if the VTT effort is to be successful in the long run. During the interviews, few DLIFLC staff appeared to recognize these needs. Furthermore, few resources appear to have been allocated to this effort. The task force feels that the VTT program is unlikely to reach its full potential without firm empirical evidence to support key directions in assessment, in course design and development, in correlating the VTT courses with other options available to participating units, etc.

The task force makes the following recommendations regarding the research requirements for the VTT program:

A system of diagnostic testing should be considered for use in VTT language courses. Teachers could then have access to summary information about the diagnostic results prior to initiating the course. Such tests are not currently available. The responsibility for the design and construction of these tests would logically be assigned to research and testing professionals housed within the Program Evaluation, Research, and Testing Directorate (PERT). Ideally diagnostic tests could be developed for each anticipated course or for key skills at required levels of language proficiency in targeted languages. Objective-based achievement tests should also be developed by the instructors of each VTT course in order to assess specific student progress and provide direction for course improvement.

2. Research studies should be conducted to determine the optimal media mix for various kinds of VTT training applications, e.g., site settings, student groups, MOS categories, active vs. reserve units, and various languages. CAS instruction, as well as the new multimedia computers furnished to TNET sites, deserve consideration in addition to the more familiar TNET audio, video, and graphics capabilities.
3. Needs assessment should be conceptualized as an ongoing process related to factors such as course and systems development, change in the Reserve Component's role within the military structure, student requirements, technology advances, the needs of target groups, and the nature of the courses being offered.

4. Studies should be conducted to more clearly specify the appropriate role of VTT within the context of available training options and materials at the remote training sites.
5. To provide for improved maintenance/refresher course design strategies for VTT, research is needed to determine the differences in the conditions of effective teaching and learning in language *maintenance/refresher* courses versus the more familiar *acquisition* courses.
6. VTT both offers opportunities and imposes limitations upon student assessment and testing. Research should be conducted regarding effective assessment and testing techniques in the context of VTT course delivery.

CONCLUSIONS

In conclusion, it is recognized by the task force that the VTT program at the DLIFLC is in a rapid state of development and expansion. The institute appears to be using its best efforts to effectively build the program and is already implementing a number of improvements to assure the effectiveness and efficiency of the program. The organizational and procedural factors involved in implementing the program present a rapidly moving target and no external group can learn all that is happening in a program in a short period of time. Thus, some of the task force's recommendations may have been implemented to some degree already or are planned for the future. Others may have been considered and discarded due to factors unknown to the task force. However, the task force, given the information available to it, feels that the recommendations are valid. Therefore, it suggests that the DLIFLC should carefully review and consider the recommendations as it moves ahead with VTT program implementation.

Perhaps the most difficult recommendation for the DLIFLC to address is the task force's recommendation to undertake the suggested strategic planning effort. This may be due in part to the fact that the VTT program is struggling to meet the challenges of rapid expansion in both the scope of the TNET system and language courses offered via VTT. It is difficult during a period of rapid development to divert key staff resources from developmental and operational tasks. However, the task force feels strongly that the long-term viability and success of the program will be best served by making key decisions about the future directions of VTT despite the difficulty in obtaining adequate resources for the planning effort.

In the strategic planning process, as well as in the operation of the existing program, the task force suggests that the specific recommendations in this report be given careful consideration. While each of the recommendations is important and the task force does not imply that some of the recommendations should be ignored at the expense of others, the task force would like to highlight several recommendations that deserve priority attention. These include the following.

Under the heading of *VTT course effectiveness*, it must be recognized that the delivery of high quality courses is critical to the long-term viability of VTT as an approach to nonresident language training. The development of a validated instructional design for language maintenance/refresher and enhancement thus appears critical to this effort. Under *course delivery*, maintaining technical system reliability and development of the required field support structure are critical to the success of VTT for the training of linguists. The report describes a number of factors to address in this regard. Under the heading of *course evaluation and student data collection*, emphasis is needed to develop a comprehensive and responsive system for data collection, storage, and reporting. The development of student/unit report cards and diagnostic tests of language ability would be useful.

The development of improved *facilities* to replace the makeshift current facilities is required in order to facilitate the long-term success and growth of the program. Facilities should be carefully designed from a functional perspective and planning should begin with the development of educational specifications.

Under *system development*, the DLIFLC should keep the needs of VTT customers paramount, develop an effective partnership with the units to be served, and emphasize the delivery of an effective, high quality product. At the same time, the VTT program should remain focused--doing what the DLIFLC can do best and not establishing expectations which cannot be met.

Finally, it should be recognized that changes in video teletraining technology continue to outpace the capability of educators and trainers to optimally make use of it. There are a number of key research questions listed in the report which the DLIFLC should address as the VTT program evolves.

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APPENDICES

APPENDIX A

Summary of Task Force Recommendations

GENERAL OBSERVATIONS AND RECOMMENDATIONS

The recommendations of the task force are summarized here in outline form as a means for quick review or presentation of the results of their efforts. The reader is cautioned that additional details are presented in the full text of the report and that these should be cross-referenced when examining the recommendations in full.

General Observations

- 1 The DLIFLC has successfully demonstrated the potential and feasibility of VTT technology for foreign language instruction and has attained a leadership position in this field.
2. Early VTT courses were experimental in nature and involved few sites and course participants. There is an effort underway at the DLIFLC to substantially expand the scope of the program. There is enthusiasm at many levels of the DLIFLC for the expansion of the effort. An expansion of TNET sites has been made possible by a special appropriation in the FY 91 Department of Defense budget.
3. The DLIFLC has identified FY92 resources necessary to provide for substantial near-term growth in both course offerings and clients served. DLIFLC teaching and technical support staff have been added to the Distance Education Division to support the VTT program.
4. The DLIFLC is entering a period of transition from experimentation and pilot testing to broader service delivery and institutionalization of the VTT program.
- 5 Now is the time to build a solid foundation to support VTT delivery of language instruction as an integral part of the DLIFLC nonresident program services.
6. The effort to build a solid foundation for the VTT program should commence with a strategic planning process such as that described below and in the body of this report.

General Recommendations for Planning

1. Develop a clear *mission statement* for VTT. This is a broad statement of the unique purpose for which VTT exists and the specific function it performs. This will help the DLIFLC staff focus on the role of VTT within the available nonresident training options, as well as to identify the specific groups to be served. It is important to remember that an organization or program cannot be "all things to all people." Therefore, it is critical to determine the "market niche" of VTT and focus its efforts accordingly.
2. Establish *strategic policies* (parameters). These are management pronouncements that establish the parameters within which the organization will accomplish its mission. In other words, they state what activities VTT will and will not do.
3. Assess DLIFLC *organizational strengths*. Identify the characteristics which contribute to the ability of the organization to achieve its mission.
4. Assess *organizational weaknesses*. Identify the characteristics which limit the ability of the organization to achieve its mission.
5. Examine the *organizational structure*. Critique the present organizational structure, which represents the current commitment of resources toward certain objectives. The examination may reveal inappropriateness of the present structure for the emerging emphases in mission and objectives. The examination would identify such factors as span of control, gaps, redundancies, verticality (layers), and formal vs. informal organization.
6. Evaluate the *competition*. What other organizations attempt to fill the same needs as the VTT program? Determine how this relates to what the DLIFLC is trying to accomplish with the VTT program.
7. Perform an analysis of *external factors*. Examine those forces over which VTT or, for that matter, DLIFLC has little or no control.
8. Establish *objectives* for VTT. Express the desired, measurable end results for VTT. It is suggested that the objectives for VTT focus upon outcomes such as student success, performance, and/or achievement, rather than process variables.
9. Develop *action plans* to implement the strategies identified in the planning process.

10. Review and update the plan annually to meet new and emerging conditions and assist in maintaining organizational focus.

SPECIFIC RECOMMENDATIONS

A. Staffing

1. Examine the existing VTT organizational structure to identify additional staffing required both at the DLIFLC and remote sites to support an expanded VTT effort. This examination should take into account a planned incremental expansion that does not overburden existing staff and cause a decline in VTT (and resident DLIFLC) program quality. The organizational structure(s) should be designed to avoid staffing gaps and redundancies.
2. Consider converting two of the 18 new VTT teaching positions into positions dedicated to the tasks of: (a) clear articulation of an enhanced VTT curriculum and instructional design process, and (b) teacher training and other necessary staff development both at the DLIFLC and at the field sites.
3. Provide for the inclusion of flexible, individual work schedules in the staff utilization plans, since many of the VTT program course offerings will not fall within the normal 8-5 workday.
4. Obtain additional engineering and technical assistance staff, on either a contractual or permanent basis, to maintain the expanded VTT system at an acceptable performance level, e.g., 95-99% reliability.
5. Consider the impact of VTT staffing demands upon the resident programs. Assuming that 18 instructors were recruited from the existing resident program, the impact, at first glance, would not appear to be great (approximately 2%). However, the impact could be significant upon certain programs, e.g., a small program with few faculty or high-enrollment languages with heavy teaching requirements.
6. Plan and provide a careful program of staff development for DLIFLC course developers, instructors, field coordinators, technical staff, managers, and other VTT staff.
7. Provide an orientation program for DLIFLC and field unit staff who are not familiar with the VTT program. This program should address the effective development of VTT and its role in language training.

8. Pay careful attention to appropriate staff recognition and rewards since extra time and effort are often required for course development and instruction.

B. Coordination

1. Formal agreements should be put in place to assure that contributing DLIFLC units both understand and agree to perform the tasks required to make VTT a success. Once these agreements are in place they should be carefully monitored by management to assure that tasks are being performed as scheduled and that the agreements are fine tuned or modified as needed.
2. Effective communication among the various DLIFLC VTT program participants is essential to success. To that end, it is suggested that there be regular VTT management meetings incorporating representatives from affected DLIFLC units, and that focused team meetings (e.g., course design, course development, network expansion, course scheduling) be regularly held to address specific ongoing facets of program implementation.
3. Procedures should be established to assure the timely and effective flow of essential information among DLIFLC units and staff. It is suggested that procedures be established to report information such as course design procedures, course development needs, course scheduling, evaluation, course participation, technical developments, network expansion, etc.
4. Effective user involvement at all levels is essential to VTT success. This should remain a high priority for staff from the Distance Education Division. It is suggested that field involvement be obtained during all phases of project implementation including planning, site development, course selection, course scheduling, data collection and reporting, etc.
5. Formal agreements should be established with the remote VTT classroom sites which specify in detail the requirements for establishing and equipping each site, site operation, course scheduling and attendance, data reporting, staffing, etc. Site operation and course administration procedures and guidelines should be provided to all participating sites.
6. Procedures and guidelines should be established for effective communication and reporting to field participants. It is suggested that information about the VTT program be routinely provided to all potential VTT participants through items in standing DLIFLC publications. Furthermore, a VTT newsletter should be developed and distributed to all

current and scheduled participants to keep them informed about VTT developments, results, and course offerings. The outcomes of course participation should be routinely reported to participating units and students.

- 7 An emphasis upon customer satisfaction should be stressed in dealing with the participating VTT sites. Attention to user needs, responsiveness, and an attitude of constructive problem-solving should be stressed.

C. Evaluation, Student Data Collection, and Reporting

1. A registry of information about students should be obtained prior to beginning the delivery of a course. This should include MOS, DLPT scores, summary of prior training, and perceived unit and individual training needs. When a VTT course is completed, attendance records, achievement data, and course ratings should be added.
2. To assure that the ongoing evaluation activities are properly managed and conducted, an individual or existing office should be assigned to assist the VTT program. This person or office would represent the evaluation perspective in ongoing project activities, and be responsible for designing and managing the overall evaluation effort. The evaluator should have the required expertise (i.e., research and evaluation methodology, language instruction, curriculum design, etc.) to assist development teams to specify measurable objectives, construct questionnaires and achievement tests, and define specific data and reporting requirements.
3. Questions about the *delivery system* vs. the *instruction provided* should be treated separately when evaluating VTT courses. In addition to more general assessments of the VTT courses, teachers and students can benefit from specific diagnostic pretests designed to measure skill levels and identify areas for training emphasis prior to beginning a VTT class.
4. Data regarding attendance and performance should be gathered and retained at both the student and course levels. Using these data, two types of report cards should be prepared by the instructor/course coordinator. A report card which summarizes unit performance should be sent to the military unit. Additionally, each student should receive a report card reflecting individual performance and suggesting areas and instructional materials for follow-up study.
5. The above data and other information provided by the site coordinator should routinely be made available to course development teams to assist

in decisions regarding course offerings, training needs, course scheduling, and course improvement.

6. An annual, external evaluation of the VTT program should be conducted in order to determine progress and assist in the refinement process. The evaluation design should reflect the concerns of the various participants in the VTT program and be carefully guided by an assigned representative of the DLIFLC's Evaluation and Research Division.

D. Facilities and Equipment

1. Plan to acquire permanent facilities to house VTT instructional studios and related support spaces. Support spaces should include a practice studio, tape library/storage room, technical equipment repair room, instructor work and break rooms, audio taping studios, tape duplicating room, and related restroom, circulation, and mechanical spaces.
2. To alleviate coordination problems, explore the feasibility of housing the VTT program in a larger, distance education facility. This would preferably accommodate management and support staff as well as have the technical facilities required for course transmission.
3. Facility flexibility needs to be addressed in the planning process. Where new construction is planned, adaptability and flexibility of interior spaces is essential to accommodate changes in teaching/instructional models and technological obsolescence.
4. To insure that the physical environment enhances, rather than detracts from instructional and related activities, develop a set of educational specifications to state the detailed requirements of the program and occupants. Educational specifications are then given to the architectural design professionals at the beginning of the facilities design process.
5. Given the feedback from the VTT pilot tests and in light of item 4 above, criteria for physical and equipment requirements for remote site classrooms should be reviewed and refined.
6. To maximize student learning opportunity/performance, each remote classroom site should acquire equipment and furnishings as well as provide the physical space as specified by AETD and DLIFLC. These specifications should be a requirement for remote site participation.
7. The DLIFLC is held in high regard by remote sites as a provider of high quality services. In order to continue the success of VTT and maintain

quality performance, a high priority should be placed by AETD and DLIFLC on correcting any current network and site technical problems. The DLIFLC should establish and maintain high standards of network performance and reliability.

8. Explore the feasibility of equipping one instructional studio to transmit one-way, full-motion video to reach a large number of additional sites already equipped to receive this type of transmission. This should be considered as an experimental portion of the VTT program.

E. Course Effectiveness

1. An overall instructional design should be developed for VTT language instruction. The design should reflect the purpose for which VTT instruction is being used (i.e., refresher training, remediation, military skill training, instructor training, etc.), the broad goals and objectives of the instructional program, sub-objectives and lesson objectives, utilization of media options within lessons and study materials, lesson length and format, and other relevant information for course developers.
2. An instructional design and curriculum development effort should be mounted specifically for VTT instruction that recognizes the differences, capabilities, and challenges inherent in this approach to distance education. It should be recognized that VTT is a unique form of instruction which places specific demands on various course components. While segments of the existing resident and nonresident programs may be utilized or adapted for use within the VTT courses, these materials should be identified only after the instructional design is established and the materials can be identified for a specific purpose. Course development should involve participation by resident curriculum personnel and teachers.
3. In order to successfully implement VTT, a small number of courses should be initially prepared based on identified MI unit needs and DLIFLC institutional capacity. This core group of courses can then be gradually expanded as experience is gained in preparing and offering VTT instruction, and as needs are further articulated by the target populations. This would suggest developing an evolving catalog of expanding course offerings that would be made available to users.
4. To enhance course effectiveness and assist the effort to develop reusable course elements, a student guide and site coordinator's manual should be developed for each course. The student guide and site coordinator manual should both explain course procedures and include all relevant hard-copy course materials.

5. Provision should be made for continuous assessment of client needs and the effectiveness of VTT courses in addressing those needs. Such assessment would include information about individual and unit language training requirements, specific course components, and resources needed to address these requirements.
6. Students and field units should be routinely asked to comment on the effectiveness and quality of the instructional and technological components of VTT courses.
7. Careful consideration should be given by the DLIFLC to the differences in the design and procedures for VTT courses for AC vs. RC personnel.
8. For reasons of economy, consideration should be given to instruction that can be offered via point-to-multipoint networking (e.g., more generic training) as compared to instruction requiring strictly point-to-point communications (e.g., training focused on more advanced speaking skills).
9. Site managers should be required to keep continuous logs of classroom events as courses are being transmitted/received (e.g., audio loss, video problems, interference, local classroom disturbances, power difficulties, student attendance as affected by drills, alerts, etc.) in order to better interpret the observed results of VTT courses.

F. System Development

1. Users need to know what to expect from VTT course offerings. This can be made explicit through publishing a phased development plan. Such a plan would assist in maintaining the credibility of the DLIFLC teletraining program by not disappointing clients' expectations. The development plan should be consistent with the institute's ability to deliver a quality product within available resources.
2. The VTT effort should not be developed in isolation from other DLIFLC language programs, media, and delivery systems. Appropriate DLIFLC instructional materials should be adapted for use in VTT courses, where possible. Cost-effective use of existing on-site language program resources integrated within the VTT instructional design should be explored. Further, an assessment should be conducted to determine the feasibility of linking VTT course delivery to alternative existing distance education networks (both military and civilian).
3. A strategic planning effort should be mounted to establish a *clearly articulated mission* for the VTT program within the broader mission of the

DLIFLC. The importance of the task force recommendation that the DLIFLC establish a strategic planning team is reiterated here. The planning team should develop a clear mission statement and measurable goals and objectives. It should identify a set of strategies to implement programs to meet the goals and objectives. Further work would provide operational plans for these strategies and establish accountability with acceptable performance criteria.

G. Research

1. A system of diagnostic testing should be considered for use in VTT language courses. Teachers could then have access to summary information about the diagnostic results prior to initiating the course. Such tests are not currently available. The responsibility for the design and construction of these tests would logically be assigned to research and testing professionals housed within the Program Evaluation, Research, and Testing Directorate (PERT). Ideally diagnostic tests could be developed for each anticipated course or for key skills at required levels of language proficiency in targeted languages. Objective-based achievement tests should also be developed by the instructors of each VTT course in order to assess specific student progress and provide direction for course improvement.
2. Research studies should be conducted to determine the optimal media mix for various kinds of VTT training applications, e.g., site settings, student groups, MOS categories, active vs. reserve units, and various languages. CAS instruction, as well as the new multimedia computers furnished to TNET sites, deserve consideration in addition to the more familiar TNET audio, video, and graphics components.
3. Needs assessment should be conceptualized as an ongoing process related to factors such as course and systems development, change in the Reserve Component's role within the military structure, student requirements, technology advances, the needs of target groups, and the nature of the courses being offered.
4. Studies should be conducted to more clearly specify the appropriate role of VTT within the context of available training options and materials at remote training sites.
5. To provide for improved maintenance/refresher course design strategies for VTT, research is needed to determine the differences in the conditions of effective teaching and learning in language *maintenance/refresher* courses versus the more familiar *acquisition* courses.

6. VTT both offers opportunities and imposes limitations upon student assessment and testing. Research should be conducted regarding effective assessment and testing techniques in the context of VTT course delivery.

APPENDIX B

SAMPLE EDUCATIONAL SPECIFICATIONS (Selected Items Only)

GENERAL DESIGN CRITERIA

The following general design criteria should be considered to the maximum extent possible by the design professionals in the construction of a VTT Distance Learning Center.

Adaptability and Flexibility of Interior Spaces

Adaptability and flexibility of interior spaces are essential. It is anticipated that the structure will have a useful life of at least 30 years; therefore, Facilities Management must have the ability to reconfigure interior spaces to meet future VTT and distance learning needs. To provide for this eventuality, the following features are required:

- As much clear span as is structurally feasible should be provided. Load bearing walls should be located only on the building perimeter, with interior walls being non-load-bearing.
- Where fixed installations are required, they should be located on the perimeter walls.

Instructional Areas

VTT studios should be clustered with control facilities wherever possible. Explore the suitability of corridors on the perimeter, or exterior, covered walkways.

The relationships and locale among various instructional and support areas are suggested in the detailed Educational Specifications.

Heating, Ventilating, and Air Conditioning

Design criteria for heating, ventilating, and air conditioning are based on the following factors: comfort, cleanliness, reduction of odors and noise, teacher/student alertness, codes, cost of maintenance/operations, and adaptability to control in relationship to periods of use as related to outdoor conditions.

The design of the indoor environment for teaching and learning must be made with consideration of heat gain and loss, air movement, humidity control, occupant density, independent operation of various components, and automatic control systems.

- It is essential that the level of noise from the ventilation system be kept as low as possible in the VTT studios.

Technology

The design professionals must plan and prepare for a variety of existing and emerging technologies related to VTT and distance education. These technologies relate to equipment (video, audio, data, and print) and transmission (satellite, cable, microwave, and fiber optics).

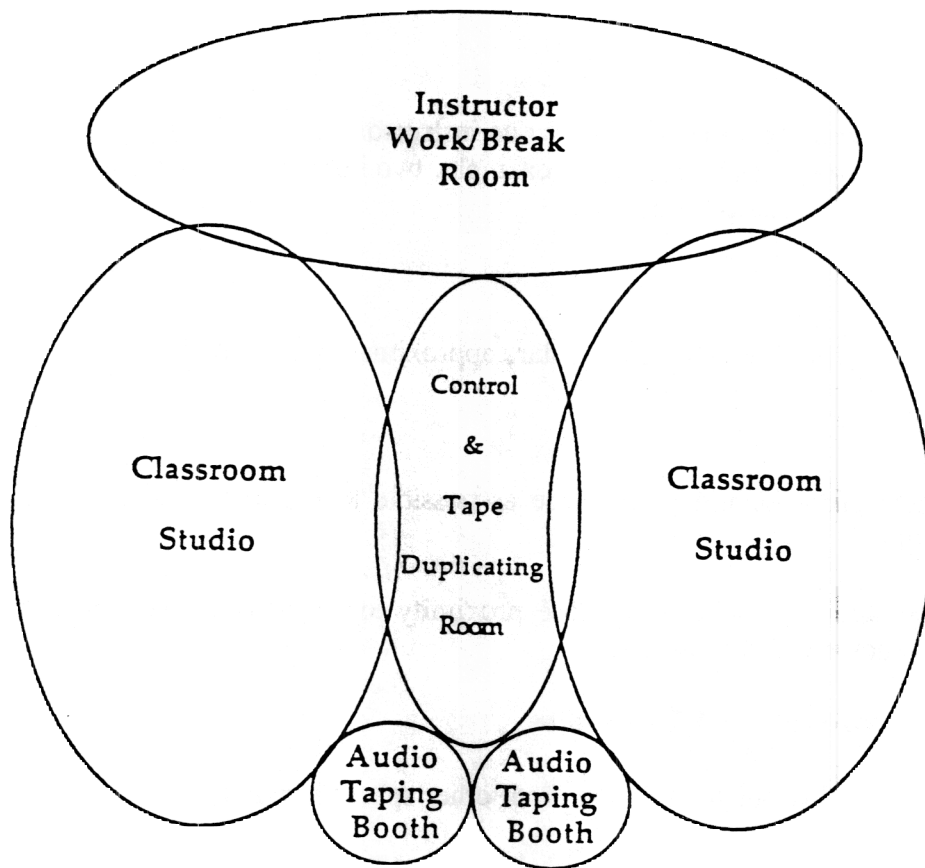
To accomplish these intentions, the following should be provided.

The design professional should be cognizant that video/audio aids are used extensively. The primary design for visual/audio aids is the projected picture. Such projections, primarily video screen (television) are a contrast of light and shadow. Since it is light, not shadow, that is projected, extraneous light washes out the shadow and destroys the picture. The design of studios and classrooms must consider visual/audio presentations as a prime factor. The following suggestions should be incorporated:

- Limit the use of interior and exterior windows.
- Use caution when selecting light fixtures, dropped beams, or other protuberances below the finished ceiling which may interfere with projections.

(SAMPLE)
SUGGESTED SPACE RELATIONSHIPS

VTT AREA



VTT INSTRUCTIONAL STUDIOS

The VTT instructional studios are used to present foreign language instruction to students at military sites throughout the country by electronic means. The current VTT technology is two-way compressed video and audio, with print and fax support. The long-distance communications are carried via satellite. The classroom is also used for in-service teacher training.

Staffing

The studio is normally used by one instructor and a VTT technician. The studio may be used by up to six persons, for example, two instructors, the technician, and three students during special presentations.

The studio should be rectangular, approximately 550 sq. ft.

Location

Each studio should be as close as possible to the control and tape duplicating room.

The studios should be in close proximity to and with convenient access to the instructor work/break room.

Desired Features of the VTT Studios

High quality sound isolation from other spaces required.

Capability for two-way visual observation between control and tape duplicating room and classroom.

Parabolic-type lighting with local lighting control.

Accent lighting in instructor presentation area.

Provision for computer, satellite, and fiber optic access.

Availability of 110/120 volt electrical power (several isolated 15-20 amp circuits per studio). Locate a four-plex outlet on each wall.

Provision for a wall-mounted video camera with a 160 degree sweep, remote controlled (desirable).

Low-gloss paint, pastel colors preferred, on wall surfaces.

Securable access.

Carpeted flooring.

APPENDIX C

LIST OF ACRONYMS

AC	Active Component
AETD	Army Extension Training Directorate
ARNG	Army National Guard
ATSC	Army Training Support Center
AVN	Aviation
Bde	Brigade
Bn	Battalion
CAS	Computer-Assisted Study
CAI	Computer-Assisted Instruction
CD-I	Compact Disc-Interactive
CONUS	Continental United States
DCTN	Defense Communications Teleconferencing Network
DLIFLC	Defense Language Institute Foreign Language Center
DLPT	Defense Language Proficiency Test
DoD	Department of Defense
ETNA	Educational Technology Needs Assessment Project
FLAMRIC	Foreign Language Maintenance/Refresher and Improvement Course
FLTCE	Foreign Language Training Center, Europe
FORSCOM	Forces Command, U.S. Army
FY	Fiscal Year
HVAC	Heating, Ventilation, and Air Conditioning
ISD	Instructional Systems Design
IST	Institute for Simulation and Training, University of Central Florida
LPM	Language Program Manager
MI	Military Intelligence
MOS	Military Occupational Specialty
NCEUR	National Cryptologic School, Europe
NCS	National Cryptologic School
NTU	National Technological University
PDPEC	Professional Development Program Extension Course
PERT	Program Evaluation, Research, and Testing Directorate, DLIFLC
RC	Reserve Component
SCOLA	Satellite Communications for Learning, Associated
TNET	Army Teletraining Network
TPDC	Defense Training and Performance Data Center
TRADOC	U.S. Army Training and Doctrine Command
USAREUR	U.S. Army Europe
VCR	Video Cassette Recorder
VTT	Video Teletraining