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Improving Chinese Language Instruction At The Defense Language Institute Foreign Language Center (DLIFLC) Through Technology: Report Of The Chinese Language Task Force

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12424 Research Parkway, Suite 300
Orlando FL 32826

University of Central Florida
Division of Sponsored Research

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BACKGROUND

A Chinese Language Task Force met at the Defense Language Institute Foreign Language Center (DLIFLC), Monterey, California, June 11-15, 1990. The Task Force was a sub-part of the Educational Technology Needs Assessment (ETNA) Project. The ETNA Project is a DLIFLC initiative to improve the use of technology to teach foreign languages in the DLIFLC's resident and nonresident programs. The DLIFLC is assisted in this effort by the Department of Defense Training Performance and Data Center (TPDC). TPDC, in turn, contracted with the Institute for Simulation and Training (IST), University of Central Florida, Orlando, Florida. IST was assisted in this effort by a consultant team consisting of experts in Chinese language instruction. Members of the consultant team were: Dr. A. Ronald Walton, Mr. Kim Smith and Major Michael E. Everson (Ph.D.). The full list of participants is included as Appendix 1. On-site activities of the task force are listed in Appendix 2.

CHARGE

The Chinese Language Task Force was charged with addressing the following objective: Determine how to use computer technology to improve the teaching of Chinese at the DLIFLC.

The Task Force was specifically directed to focus on the following aspects of instruction:

- Character Systems
- Sound and Scripts
- Area background and culture
- Teaching of grammar

Additional guidance about technology use was provided by DLIFLC as follows:

- make the "grind" more interesting
- expose the students to the daily life in China
- help the students develop listening and reading strategies
- make out-of-class preparation meaningful
- provide timely diagnostic feedback
standardize the teaching of grammar
- maximize one-on-one teacher-student interaction

The original scope of the Task Force was to broadly address non-romanic languages taught at DLIFLC, but this was later limited to Chinese Mandarin language instruction. However, the Task Force was asked to comment upon the applicability of its findings to other non-romanic languages in general, and to the Cantonese dialect in particular.

The ETNA project team suggests that the process developed for the effective use of technology in Chinese language instruction may serve as a model for other language departments at DLIFLC. The proposed model also may meet the needs of the broader language training community.

THE APPROACH

The approach of the team is described below under two broad categories: Rationale for Computer Based Instruction, and Guiding Principles.

A. Rationale for Computer Based Instruction (CBI)

The rationale described below was derived from the discussions and presentations described in Appendix 2. The current instruction in the Chinese program is essentially print and audio-based and for the most part would seem to be oriented to classroom learning. The rationale for transferring certain instructional components to CBI can be summarized below:

1. CBI allows for a richer learning environment using multimedia technologies.
2. CBI is more interactive than print or audio-only instruction and is presumably more interesting and motivating to the learner.
3. CBI allows for instant feedback and self-evaluation of learning mastery.
4. CBI encourages standardization of instructional goals and content. This in turn facilitates the use of CBI materials in other instructional environments both within and beyond the military sector.
5. The computer can serve to manage non-classroom instruction with added flexibility; at present, there seems to be little systematic management of non-classroom instruction.
(6) The computer facilitates the collection of data on the effectiveness of pedagogical design as well as data on individual learner and group-learner performance. Such data can lead to quick adjustments in design as well as improved remediation for individual learners and even entire classes.

B. Guiding Principles

In addition to the usual rationale for CBI as given above, the Team was guided in its deliberations by the following principles:

1. Effectively improving the quality of instruction in a DLIFLC department through technology requires a comprehensive approach. An in-depth analysis of the curriculum and the uses of technology throughout the curriculum should be performed.

2. Create a pedagogical design for the CBI components independent of any particular hardware/software configuration so that the design is always transportable to new and better technologies; that is, let technology adapt to pedagogy rather than the reverse.

3. Make every effort to adapt available quality print and audio instructional materials to the computer environment rather than creating new instructional materials. For the use of realia, emphasize the development of templates that will facilitate the use of fresh source materials on an on-going basis.

4. Emphasize the use of present and very-new-future technologies.

5. Assume from the outset that any proposed CBI components are experimental and open to change and improvement. Data collection on effectiveness of delivery is essential.

PROPOSED COMPONENTS

Design Rationale

The theoretical framework that underlies the components of this model is primarily learner-centered. This framework draws from valid language and psychological learning principles that are shared in existing language learning models. This design framework will respond to the unique needs of Chinese and include the following elements:

-- Multiple learner strategies will be accommodated.
-- Instructional activities will involve what we term "fact" (declarative) and "act" (procedural) knowledge.
Cognitive processes for encoding different skill components will underlie the instruction. Memory capacity requirements for spacing, sequencing, and repetition will be included in the design.

An outline of proposed design components and narrative amplification follows:

1. Orientation Modules
   (a) Pronunciation and Romanization
   (b) Introduction to Chinese Characters
   (c) Introduction to reading in Chinese

2. Language Skill Components
   (a) Vocabulary (Speaking/Listening)
   (b) Aural Comprehension
   (c) Reading

Mix of (1) Adapting current print/audio material to CBI
(2) Infusion of realia materials for building strategies

3. Grammar Component
   (a) Introduce grammatical features congruent with current print/audio materials
   (b) Standardize grammatical explanations

4. Learner Strategy Help
   (a) Provided for each CBI activity
   (b) Teaches learner how to approach the relevant skill

5. Metalanguage
   (a) Teaches learner how to use Chinese to interact with teachers and native speakers in discussing language learning

6. Culture Component
   (a) Build into each lesson as appropriate--in English
   (b) Cultural understanding through use of authentic video
   (c) Informational culture--use videodisc in English

There are certain components of the Chinese language learning curriculum which can be effectively taught through CBI. Through the use of Graphic User Interface (GUI) and sound, the romanization and sound system can be taught to the learner in a more interesting and
interactive manner, thus eliminating the need for the learner to attend lectures on the sound system which usually stress the principles of structural linguistics. The graphics qualities of color animation present new opportunities to design programs which introduce Chinese orthography in a way that will capture and hold the learner's attention. Such character introduction programs can highlight character composition (radical/phonetic), stroke order, character print-types, historical development, and a brief introduction to dictionary usage. These programs are designed to teach fundamental principles which will stay with the learner throughout his/her Chinese language learning career and are not tied to any specific Chinese curriculum. Thus, they can be used by a variety of learners in the government or academe. The first introductory module on the sound system could be designed in approximately 1-2 months, while the introductory orthography module would take approximately 4-6 months.

The use of CBI also holds promise for easing the drudgery experienced by all students who learn to read Chinese. Chinese orthography is characterized by very irregular and unsystematic sound-symbol correspondence and yields virtually no cognates for the learner to work with. We believe that CBI can help to mediate these problems by providing sound as well as "help" features in the form of on-line dictionaries, grammar help, and even provide learning strategies for the learner to use to more effectively deal with the text. It should be noted that the use of learner strategies will be highlighted throughout our lesson design. Additional lesson design features such as pre-reading exercises, skimming/scanning and timed exercises can also give the learner meaningful practice with a variety of texts.

Listening comprehension can also be enhanced through programs designed with graphics and/or videodisc/CD ROM which provide more meaningful context through the use of a sound/visual multi-media environment. Videodisc presentations of speech situations can also aid the learner by contextualizing certain grammar features of the language by presenting different types of situations where these grammar features occur. Projecting timelines for projects such as these is more difficult since they are dependent upon the amount of content one plans to include in the lesson.

Finally, the desire to learn about the target culture has consistently been shown to be a motivating force in foreign language learning. We therefore suggest that students be taught Chinese culture as part of the DLIFLC curriculum. In addition to more formal lessons that teach students about the Chinese history, people, and culture, maximum use of videodisc or CD ROM technology should be used to capture interactions between native speakers in natural settings so as to highlight the cultural features of natural discourse.
DEVELOPMENT

Required Hardware and Software

The recommendations of the Team could be implemented with either or both of the following configurations:

- Macintosh IIc series computer with 4 Megabytes of memory
- Color monitor with 256 color card as a minimum
- 40 Mb hard disk
- 1 HDFD 3.5 inch diskette drive (2 recommended)
- Mouse

or

- IBM PC or compatible with 80286 processor running at 12 Mhz or faster (80386 recommended)
- 3 Mb of memory
- VGA color monitor and adaptor
- 40 Mb hard disk
- 1 1.4 Mb 3.5 inch diskette drive (2 recommended)
- Mouse
- Sound digitizing board

For development purposes, the Task Force suggested that 5 such machines would be necessary. For student use, an initial set of 25 to 30 workstations, at a unit cost of $3,000-$4,000 would be sufficient. Both systems should have some means of back up of hard disks. We recommend Iomega Bernoulli Box or similar data cartridge drives with at least 20 Mb storage capacity.

Systems could eventually be tied into Local Area Networks which would allow sharing of programs and data.

IVD equipment recommended: Videodisc player such as Pioneer LD-V 4200 (approximately $1,000) or Sony LDP 200 (approximately $1,000) with appropriate monitor or overlay system for display of video.

Development software: Hypermedia authoring program such as HyperCard, Plus, SuperCard on the Macintosh or Tool Book, Plus, WindowCraft or other on the IBM PC or compatible. Windows 3.0 should be the operating system for IBM's or compatible.

CD ROM could be added at a later date.

Required Expertise

Given the small number of pedagogical and technological specialists in the entire U.S. Chinese language teaching community, it is unlikely that any single institution or agency will have all the expertise required for the activities proposed. Depending on
the type of expertise required, DLIFLC would be wise to go for outside assistance where necessary. The team suggested that five types of expertise would be required: Pedagogical Design, Computer Design, Production, Evaluation and Management.

(1) Pedagogical Design
These experts would provide the pedagogical design for the proposed CBI components. Personnel could include some members of the DLI Chinese Department, members of other government agencies (Mike Everson, Air Force Academy, Merryanna Swartz, USA Research Institute) and members of the civilian community such as the current team (Smith, Walton), Galal Walker of Ohio State University, Clara Yu of Middlebury, Wally Sergent of the University of Northern Iowa, and Ed Hayes of Kenyon College.

(2) CBI Design
(a) Members of this group of experts would be responsible for implementing the pedagogical design in a CBI environment and would be expected to have experience in working with Chinese on the computer. In addition to Bill Yui at DLIFLC, the staff of the DLIFLC Educational Technology Division, and members of other government agencies (Mike Everson, Air Force Academy, Merryanna Swartz, USA Research Institute), the civilian pool would include such experts as Kim Smith (BYU), Chuck Alber (U. South Carolina), Clara Yu (Middlebury), Rick Kunst (Duke) and Ted Yao (Mt. Holyoke).

(b) General education technology support is required to provide relevant training, installation, equipment maintenance, updating of hardware and software, etc. The assistance of the DLIFLC Educational Technology Division would be required.

(3) Production Expertise
Many of the experts cited in items 1 and 2 above could provide assistance in this area. The team suggests that once pedagogical and CBI templates have been created, DLIFLC train carefully selected Chinese program instructors to carry out the production process. This training would require from 2 to 4 weeks. MLI's would most likely play an important role in the production phase.

(4) Evaluation
Experts in evaluation are required to track the development stages and provide feedback for revision and improvement of specific CBI components. The DLIFLC Evaluation Group would be called on to provide assistance in this area. Such expertise also exists on the current ETNA project team.
(5) Management
Noting the scope of the proposed CBI endeavor, DLIFLC might wish to consider utilizing a central contractor to coordinate the development activities. Ideally, a contractor familiarity with the educational technology environment at DLI would be preferred.

RAMIFICATIONS

A. Chinese as a Model

The proposed CBI initiative in Chinese would seem to be a unique endeavor at DLIFLC for several reasons. First, the proposed initiative does not treat CBI as peripheral to the existing curriculum, but rather as and integral part of the curriculum. The initiative proposes that classroom and non-classroom learning are equal components in a larger, more global learning environment. Secondly, the proposed initiative provides, for the first time, a systematic and somewhat controlled learning-management system for non-classroom study. In addition, Chinese CBI will provide a new mechanism for collecting feedback data on learning effectiveness, individual learning traits, learning problems over larger student populations, empirical data on what can and cannot be best learned in non-classroom settings and so forth.

Given these rather unique features of the proposed Chinese CBI initiative, the task force suggested that this initiative at DLIFLC be treated as a model for CBI instruction, as a model for Category 4 language instruction and more broadly as a model for all DLIFLC language instruction. Due to the learning difficulty and complexity of the Chinese language, the effect of implementing the proposed CBI initiative should provide valuable insights for the teaching of other Category 4 languages, as well as Category 1-3 languages. Thus, sufficient resources should be allocated to such an initiative if it is implemented.

B. Ramifications for DLIFLC Generally

The focus on learning, the learner, and non-classroom study inherent in this initiative suggest that the role and functions of the Curriculum and Faculty and Staff Development Divisions may require some adjustments.

1. Curriculum Division
Since the CBI model being proposed defines curriculum as the total learning environment, classroom and non-classroom, the Curriculum Division may want to develop new tools for planning and assessing non-classroom curriculum.
2. Faculty and Staff Development

To the degree that the Faculty and Staff Development Division has focused on classroom teaching and management, an expansion of role and function would likely be required in training to prepare teachers to deal with learning in general and non-classroom learning specifically. A trained teacher would, for example, be someone trained to assist in the management of learning both in and out of classrooms. Naturally, training in the use of computers as a tool for student learning would be necessary for at least some teachers.

C. Ramifications for the Chinese Program

Within the Chinese Program, the adoption of the CBI components would likely have these major effects:

(1) The role of classroom learning would have to be reassessed with the advent of a key place in the curriculum for non-classroom learning. This would lead to a focus on determining the unique contributions of the classroom as opposed to the unique contributions of the computer.

(2) The role of teachers would require reassessment, again with a focus on determining the unique contributions of teachers in classroom settings, as tutors and as managers of a more global learning environment.

(3) The role of the learner would require reassessment. The proposed CBI initiative clearly places a greater responsibility for self-managed learning on the student. This will in turn require a new emphasis on learning strategies and on educating the learner generally about language and the learning process.

(4) The flexibility of CBI would allow for more tailored training according to the specialized needs of different end users.

(5) Cantonese. With only minor modification, the principles that have been forwarded for development of Mandarin instruction in a CBI environment will be applicable to the Cantonese program. Textual materials would only require modification of romanization while aural/oral materials would have to be developed specifically for Cantonese due to the different sound system and somewhat different grammar system.
IMPLEMENTATION

It is doubtful that DLIFLC at this time has either the funding or human resources to implement the proposed CBI initiative. Moreover, the products developed through such an initiative would be extremely useful to the broader military, government, and civilian Chinese language teaching community. The Task Force thus suggests that DLIFLC consider playing a centerpiece role for a collective effort in a more national context as regards Chinese CBI. Such an approach would not only recognize DLIFLC's national status as a leader in this domain, but would possibly allow DLIFLC to attract funding support from the larger user community and to attract expertise from the Chinese language community nationally.
APPENDIX 1

LIST OF PARTICIPANTS

Dr. David Hosley, Chinese Language Task Force Coordinator
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Dr. William Bramble, Researcher, ETNA Project
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University of Central Florida

Dr. Ronald Walton, Consultant Team Leader
Associate Professor, University of Maryland and
Deputy Director, National Foreign Language Center

Mr. Kim L. Smith, Consultant
Associate Research Fellow, Humanities Research Center
Brigham Young University

Maj. Michael E. Everson (Ph.D.)
Associate Professor, Department of Foreign Languages
and Chief, Strategic Language Division
United States Air Force Academy

Mr. Andre Vernot
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Language and Area Studies Department,
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Mr. Edward Stoops
Senior Linguist
Language and Area Studies Department,
National Cryptologic School

Mr. Hugh McFarlane
Chief, Cryptologic Training System Representative
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Dr. Merryanna Swartz
Research Psychologist
U.S. Army Research Institute, Alexandria, VA

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Chief, Evaluation/Research Division
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Academic Coordinator, Asian School  
DLIFLC

Mr. William Yui  
Training Specialist, Chinese Department, Asian School  
DLIFLC
APPENDIX 2

ACTIVITIES

Colonel Donald Fischer, Jr., Commandant, DLIFLC, presented an overview of technology initiatives at DLIFLC.

Dr. Ray T. Clifford, Provost, DLIFLC, welcomed the Chinese Language Task Force participants and acknowledged the importance of the task.

Mr. Charles Olney, Dean, School of Asian Languages, gave an overview of the Chinese curriculum and program of instruction.

Dr. David Hosley, Chinese Language Task Force Coordinator, IST, presented the background of the ETNA project and explained that the Chinese Language Task Force was a sub-part of the ETNA effort.

Mr. William Yui, Training Specialist, Chinese Department, demonstrated prototype materials for the Chinese program of instruction. He focused on the 2/2+ level with specific emphasis on reading comprehension. He used the Macintosh IIcx, HyperCard with sound.

The participants visited several Chinese classes to observe instruction. The specific classes were on introduction to characters, character recognition, listening and conversation.

The participants visited the Educational Technology Division to view demonstrations of language programs in Russian, Hebrew and Arabic.

Major Michael Everson (Ph.D.), U.S. Air Force Academy (USAFA), talked about the Academy language program and presented a video tape on their Language Learning Center (LLC). The video tape emphasized USAFA foreign language lesson development with special emphasis on the use of interactive videodisc (IVD).

Mr. Kim Smith, Brigham Young University, gave a demonstration of Chinese software and lesson materials. He demonstrated alternative approaches to learning characters using IBM and Macintosh computer hardware.

Mr. Edward Stoops, Senior Linguist, National Cryptologic School, gave a report on the status of the "Arizona Project." This effort uses the Zenith Z-386 microcomputer to develop templates in Chinese, French and Japanese.

Dr. John Lett, Chief, Evaluation/Research Division, DLIFLC, presented the background and current status of DLIFLC's efforts to use technology in the teaching of foreign languages.
Dr. Merryanna Swartz, Research Psychologist, U.S. Army Research Institute, presented a demonstration of a 2/2+ level military vocabulary intelligent tutoring system for maintenance training using Macintosh hardware with HyperCard.

The participants visited Chinese language classrooms. They spent extensive time in discussion of foreign language acquisition models, pedagogy, problems unique to Chinese language learning by American students, components of the Chinese language learning process which seem suitable for computer based instruction, teacher-learner motivation, relationships of culture and language learning, teacher training, and state-of-the-art of technologies as applied to the teaching of foreign languages.