Educational Technology and Language Teaching: Research on the Application of Videos and Computers

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Educational Technology and Language Teaching: Research on the Application of Videos and Computers

Abstract
One of the major problems with the use of educational technology in China is the lack of qualified teachers who know their academic field and the application of instructional technology as well. This problem inhibits the improvement of the Chinese instructional environment and the development of the Chinese educational cause. The purpose of this research paper is to present some of the most current research in the effective use of educational technology in foreign language teaching with the focus on two technologies: video and computer. Concerning video technology, different learning styles and the implications for language learning are analyzed; the benefit from using videos and applications involving videos used in semantics teaching and videos used in culture teaching in the second language classroom are presented. Regarding computer technology, the teaching/learning philosophy of computer assisted language learning (CALL) is discussed. After that the overall computer uses in CALL are described with capabilities of computer-based technology, and then CALL material design and CALL applications to the teaching of writing are explored. Some suggestions are given on how to fit educational technology into foreign language teaching in China in order to create a rich instructional environment and to achieve optimum learning.

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Educational Technology and Language Teaching: 
Research on the Application of Videos and Computers

A Graduate Research Paper
Submitted to the Department of Curriculum and Instruction
in Partial Fulfillment of the Requirements for the Degree 
Master of Arts 
UNIVERSITY OF NORTHERN IOWA

by
Lihua Zheng
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has been approved as meeting the research requirement for the Degree of Master of Arts (or Master of Arts in Education).

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One of the major problems with the use of educational technology in China is the lack of qualified teachers who know their academic field and the application of instructional technology as well. This problem inhibits the improvement of the Chinese instructional environment and the development of the Chinese educational cause. The purpose of this research paper is to present some of the most current research in the effective use of educational technology in foreign language teaching with the focus on two technologies: video and computer. Concerning video technology, different learning styles and the implications for language learning are analyzed; the benefit from using videos and applications involving videos used in semantics teaching and videos used in culture teaching in the second language classroom are presented. Regarding computer technology, the teaching/learning philosophy of computer-assisted language learning (CALL) is discussed. After that the overall computer uses in CALL are described with capabilities of computer-based technology, and then CALL material design and CALL applications to the teaching of writing are explored. Some suggestions are given on how to fit educational technology into foreign language teaching in China in order to create a rich instructional environment and to achieve optimum learning.
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CHAPTER I

INTRODUCTION

Statement of the Problem

Educational technology can be defined as "the development, application and evaluation of systems, techniques and aids to improve the process of human learning" (Council for Educational Technology for the United Kingdom, cited in Percival & Ellington, 1988, p. 20). This definition indicates the primary role of educational technology in the improvement of the efficiency of the process of learning, concerning "a cyclical, systems approach to the design of teaching/learning situations and the use of whatever methods and techniques are judged to be appropriate in order to achieve one's desired objectives" (Percival & Ellington, 1988, p. 20).

To speak frankly, there exists a certain gap in the use of educational technology between China and the USA. In China, the application of technology in education did not emerge until the late 1960s and early 1970s, which was the result of the economic reform and being open to the world (Personal communication with C. Lin, October, 1997). The Chinese people benefitted from other countries' experiences in advanced educational technology applications. The Chinese government supported financially the purchase of the
electronic acoustic facilities for foreign language instruction from the Japanese National and Sony Companies, and the television program equipment from the Japanese National and Panasonic companies (Personal communication with C. Lin, Oct. 1997). These facilities and equipment exerted a positive effect in the instruction of varied disciplines. We may say that the Chinese people have made great efforts in keeping up with the development of advanced technology in other countries.

Thirty years have passed. What does the present Chinese instructional technology look like? The Chinese scholar Changwang Lin (Personal communication, October, 1997) provided an overview. According to him, the Chinese people are now capable of making instructional equipment (e.g. the multimedia produced in Shanghai Huadong Apparatus Factory) which have basically reached the advanced level of the world; however, the Chinese people have not kept a balance in the growth and use of the electronic instructional facilities. Only 20% of the national key universities can have access to advanced electronic instructional equipment; 80% of them have no access to them at all. In those better-equipped universities, facilities such as large screen projection, audio-visual lab, multimedia, electronic pen and floppy disks are available. Almost all military institutions
and some of the key Chinese universities such as Beijing University, Chinghua University and Fudan University are equipped for multimedia. On the contrary, in those less-equipped schools, there is usually one acoustic lab which provides only about thirty or forty seats and where only listening and reading can be facilitated. Apart from that, those schools offer some radio broadcasts for English. The major problems which the Chinese are facing now are 1) financial difficulty which leads to insufficient purchase of equipment to meet the needs of all school teachers and students; 2) the lack of qualified teachers who know their academic field and the application of instructional technology as well; and 3) the lack of academic personnel to make ready-made course software.

Those problems with the educational technology in China has hindered the improvement of the Chinese instructional environment, thus inevitably affecting the development of the Chinese educational cause.

Significance of the Review

Forcier (1996) stated the function of educational technology as follows: "learners must be provided with a rich environment of sensory experiences to which they will respond in order to build understandings" (p. 223).
Technology can be used to create such a rich environment by adopting text, sound, graphics, etc.

This paper is intended primarily to present some of the most current research in the effective use of educational technology in language learning. Due to the limited space in this paper, videos and computers will be the focus as the chief illustrated media. This paper is divided into two parts: 1) to consider the theories on application of videos and video practice; 2) to examine the theories on the application of computer and computer practice. The discussion of the two technologies aims at demonstrating how educational technology can be used to create a rich environment in language teaching field.
CHAPTER II
METHODOLOGY

Every researcher uses one or more techniques to collect data. The techniques may be classified into two categories: "quantitative, collecting data in the form of numbers, and qualitative, collecting data in the form of words or pictures" (Neuman, 1997, p. 30). To achieve optimum effect, certain techniques are used to handle specific kinds of questions or topics. This research concerns qualitative data, more specifically, adopting historical-comparative research method which examines "aspects of social life in a past historical era or across different cultures" (Neuman, 1997, p. 33). Researchers who adopt this technique should "concentrate on one historical period or several, compare one or more cultures, or mix historical periods and cultures" (Neuman, 1997, p. 33). Quite often a combination of evidence is used like existing statistics, documents (books, newspapers, diaries, photographs, and maps), observations, and interviews.

The method of identifying and locating sources was adopted to include books and magazines, the personal interviews and direct observations. Publications both in China and in the USA, especially book articles and journal articles, provided the most background and corroborative
information in this paper. Inferences could be made from these documents. Personal interviews were meant to clarify particular points concerning the application of the Chinese educational technology, to obtain additional information to support the discussion, and to attain the objective of adding something vital to the paper. They turned out to be one of the major sources of data.

Additional information concerning implications on how to apply educational technology in language teaching in China was obtained from direct observations during attendance in laboratory classes, during operation of the computer and during performing English teaching in China. There are two rationales for selecting the sources for the paper: (1) to emphasize the association of theories on educational technology with personal language teaching experiences so as to make the related theories a good guide for future professional practice; (2) to concentrate on the discussion of two of the most basic educational technologies --videos and computers--aiming the discussion to the practical instructional technology environment in China.
CHAPTER III
ANALYSIS AND DISCUSSION

Video Technology

Learning Styles and the Implications for Language Teaching

Sometimes, "theories derived from linguistics, psychology, or a mix of both were used to develop a both philosophical and practical basis for language teaching,..." (Richards and Rodgers, 1994, p.14). Recent research in educational psychology has suggested that "students' achievement increases when teaching methods match their learning styles-biological and developmental characteristics that affect how they learn" (Beaudry, Dunn & Klavas, 1989, p. 50).

What is learning style? Beaudry, Dunn, and Klavas (1989) defined it as "...a biologically and developmentally imposed set of personal characteristics that make the same teaching method effective for some and ineffective for other..." (p. 50). Richards (1994) identified six categories of learning styles:

Visual Learners

These learners "prefer visual, pictorial, and graphic representations of experiences" (P. 68).
Auditory Learners
This type of learners “learn best from oral explanation and from hearing words spoken” (P. 68).

Kinesthetic Learners
These learners learn by being “physically involved in the experience” (P. 68).

Tactile Learners
Learners of this type learn when they participate in “hands on” activities.

Group Learners
These learners enjoy group work and learn best in group interaction.

Individual Learners
This type of learners learn best when they work on their own.

Barbe and Swassing (cited in Hinkelman, 1992,) tested different modality (learning style) preferences and identified visual, auditory, and kinesthetic (tactile) modalities as “the most important sensory channels for education” (p. 27). Hinkelman (1992) described how the three learning styles are applied to second language classroom situations and offered some implications for language teaching.
In the language classroom, since visual learners benefit most from seeing words and pictures in books or on the board, pictures, written words, diagrams or charts are necessary when something is being described. In the language classroom, these learners may learn well by reading and writing. In a language lesson benefiting the visual modality the use of videos, blackboard writing, illustrated text or pictures should be involved. To reinforce the learning of auditory types, instructors should employ distinct explanations, discussions, and tape recordings. The kinesthetic learner may be assigned to participate in dramatized dialogues, role plays, field trips, etc.

One of the most bothersome tasks for a foreign language instructor is to find efficient teaching techniques. Since every person has a learning style which affects academic performance and achievement, foreign language instructors should pay close attention to the identification of an individual's learning style so as to select appropriate teaching methods to enhance language teaching.

Theories on the Application of Video

As different learners tend to have different learning styles and different learning environments take on different applied modality features, teachers should adjust activities to meet the needs of each individual learner. Owing to the
fact that videos are not used widely in the foreign language classroom in China, how to use videos in this particular learning environment to meet the needs of visual learners and to promote their learning process are discussed.

Benefits from Using Videos

Some of the basic features of video which may guide foreign language instructors in using it are summarized:

Realism. Videos can bring people and the world in to foreign language classrooms. Students can get to know Beijing, Paris or New York through the video show in the classroom (Smith, 1987).

Enhancing comprehension. A model or chart can be used in video show to "better explain the principle being taught" (Romiszowski, 1988, p. 103).

Motion. The use of video can facilitate realism (Smith, 1987) because video is especially "useful in describing motion, showing relationships, and giving impact to topic" (Kemp & Smellie, 1994, p. 57).

Color. Video color is "believable and motivational" (Smith, 1987, p. 47).

Flexibility. Videos are used for groups or individual self-paced study (Smith, 1987). It is easy to locate and move information anywhere on the disc (Kemp & Smellie, 1994). Still pictures or motion sequences may be offered in
any order (Kemp & Smellie, 1994). Videos are beneficially suited to connect one idea to another, to establish constancy of thinking (Kemp & Smellie, 1994).

Those advantages of video make it an important medium in instruction. Video, as a powerful teaching aid, can especially benefit foreign language teachers when they intend to reveal a whole communicative situation. Students learn by hearing the language, by seeing what is happening in the background, and by identifying the linguistic elements included (body language, gestures and facial expressions). Hence, video can be an ideal tool for conveying complicated information in instruction.

Guidelines in Using Videos

Some of the significant guidelines in using video are demonstrated. They are very useful in language teaching classes.

Provide the necessary background and introductory information. Videos are used to demonstrate events as supplementary information which students require for better understanding. The information is given with “video recordings of the teacher talking about the lesson on the tape, background information concerning related readings, or background notes on the demonstration lesson” (Stempleski, 1992, p. 81). Instructors should offer introductory and
summary materials to students as “a framework for the content to follow” (Heinich, Molenda, Russell, & Smaldino, 1996b, p. 7-3).

Dividing existing video into smaller units. There is not always a necessity to show the complete content of the video. Instructors can make some adaptations to the original program to meet the needs of the particular student group. The most common adaptation is “to build in some pauses at key points, allowing discussion or reinforcement of important concepts midway through the presentation” (Romiszowski, 1988, p. 228).

Reinforcing key sequences. It is necessary to repeat a particularly important or difficult segment. To help students to pick out irrelevant content and to center on the essential instructional sections, instructors need to design viewing tasks which can be taken in the form of a worksheet, filled out by students when they view the tape (Stempleski, 1992). The following aspects can be covered such as “error correction, teacher language (register, tone of voice, etc.), language skills learned, student-talking time versus teacher-talking time, resources used, and physical organization of the class” (Stempleski, 1992, p. 82). Cues which may be indicated “in the visual as arrows, close-ups, etc.” can be employed to fix the student attention on
important content (Heinich et al., 1996b, p. 7-3). The instructors may also "interlace or add on any other existing materials" which enable them to "enrich or clarify the original program" (Romiszowski, 1988, p.229).

**Encourage critical, reflective viewing.** Teachers can enhance critical and reflective viewing by letting students "engage in post-viewing activities which involve some form of writing" (Stempleski, 1992, p. 83). They may also use the "model of inquiry" created by King (1995) to help students develop a habit of inquiry by establishing their own critical-thinking questions which involve analysis, inference, evaluation, and other high-level cognitive processes.

**Pacing appropriate for audience.** "Different levels of students need different rates of presentation" (Heinich et al., 1996b, p. 7-3). Instructors should adjust the rate at an appropriate level so that students may understand the content presented with ease.

**Active learner participation.** Student involvement is significant in learning. "Overt participation", "covert responses elicited by situations" or questions are always helpful (Heinich et al., 1996b, p. 7-3).

Overall, a visual aid is not an aid unless it exerts a particular function. When instructors begin visual instructional design, they should also keep in minds these
principles on whether the student can comprehend the instructional objectives; whether the student gets ready for this method of communication; whether the objective can be achieved better by a verbal description and whether the visual achieves the desired objectives. Directed by the above guidelines and principles, instructors can use videos to design many instructional activities to enhance foreign language teaching.

**Video Applications**

**Videos Used in Oral Communication Course**

Robert (1996) demonstrated some uses of videos to enhance content and delivery skills in the Basic Oral Communication Course. Here, two of those video uses in "speaking" class are presented:

- **Practice feedback.** Venezky and Osin (1991) agreed that "for almost all cognitive learning, instruction is enhanced by evaluative feedback" (p. 9). Videos have the capacity to provide instantaneous feedback. For example, instructors can employ videos and audiotape technology to make students practice their presentations. A self-critique form can be provided for students to check both positive and negative elements in their presentations. The feedback students get in their graded presentations enable them to realize and overcome the previous errors in their next presentation (Robert, 1996).
Identification of style inhibitors. Videos are employed to recognize "distracting anxiety signaling nuances" concerning their delivery style (Robert, 1996, p. 2). Prior to the first graded presentation, students spend some time in watching a multitude of "anxiety reducing strategies", such as "impression management behaviors, breathing techniques, gesture usage, audience adapting behaviors, solid introduction development, and the generation of positive feedback" (Lucas & Freeley cited in Robert, 1996. P. 2). Instructors can design an impression management assessment for students to evaluate their primitive presentations in terms of verbal and nonverbal cues like "the quality of vocalic, facial expressions, eye contact, gestures, physical movement, and artifact manipulation" (Robert, 1996. P. 3). This assessment can diagnose student problems with their presentational styles, thus aiding them in improving the quality of their future presentations.

In conclusion, the use of videos in oral communication course can have significant impact on the amelioration of the attribute of student presentations. In China, foreign language students seldom have the opportunity to practice presentation in class, which has proved to be an effective approach to language teaching. The combination of the
application of video and class presentation will certainly contribute more to efficacious instruction.

**Videos Used in Semantics Teaching**

Videos can be also used to enhance semantic instruction in language teaching classroom. The study of meaning is sometimes called semantics. "The nature and complexity of semantic change is best shown, probably, by explication of the traditional categories used to classify changes of meaning" (Stevick, 1968, p. 266). These categories are Generalization, Specification, Amelioration and Pejoration. Examples concerning how to teach Specification with the application of videos are illustrated as follows.

Specification means a kind of change, in which, by adding to the elements of meaning, the semantic content of a word is reduced (Pyles, 1971). A good example of this is the word *deer*, which, as late as Shakespeare's age could be used in the wide sense of animal, is now limited to mean one species of animal. Another instance is the word *parson*. Originally the same word as person, it was narrowed or specialized to mean one particular kind of person, a functionary of the church. So we have the difference between person and parson today.

If the teacher only uses words to describe this kind of change, it would not be so effective because students might not have clear images of those words in their mind. However,
with the use of videos, which contain true-to-life pictures of those mentioned images, either still or in motion, the semantic changes in those words would be made very striking and impressive.

Videos Used in Culture Teaching in the Second Language Classroom

Videos can also exert great effect in culture instruction in the language teaching classroom. Crawford-Lange and Lange (cited in Mantle-Bromley, 1992) point out, "Culture is inseparable from language and therefore must be included in language study; culture is in the act of becoming and therefore should be taught as process" (p. 117). This is to say, we can not teach language without teaching the culture within that language. Here, the importance of teaching culture is emphasized. In an ideal class, the content of culture has become an integrated component of the language teaching content.

Various approaches can be used to present cultural information in second language classes. They are lecture presentations, cultural aside, artifacts and culture assimilators. Culture assimilators are used to demonstrate how videos can be applied to facilitate the teaching of the Chinese language as a second language.

Culture assimilators are a technique of providing cultural content in class. They usually consist of a short
depiction of the situation in which students are requested to solve some problems causing misunderstanding in intercultural exchange by giving the correct answer. For example, the situation is set like this: a foreign friend is invited to dinner in a Chinese friend’s home. As to what the Chinese host should do to entertain their guest at the dinner table, there are four possible answers for students to choose: 1) the Chinese host says, “Help yourself, please”; 2) the Chinese host only helps himself; 3) the Chinese host says, “Eat as much as possible;” 4) the Chinese host only helps his family members. Here, the teacher raises a situational problem for students to solve. What is the best way to present this problem? Videotape is an effective aid. This given situation can be videotaped in advance; then the teacher can display it in class. Certainly this real life scene can help students comprehend the problem much better and eventually get the correct answer. Since culture assimilators are a powerful, concise means of illustrating cultural contrasts in relevant behavioral terms, the use of videos enable the contrasts to be revealed more sharply.

To sum up, as we have observed, videos are exerting more and more important influence in language teaching class.
"Using the literature alone as a source of information for a description of CALL is rather limited" (Levy, 1997, p. 118). In order to supplement the insufficient research from the literature, Levy conducted a CALL Survey between September 1990 and March 1991, in which the questionnaires were completed. According to him, the CALL Survey "is able to provide a catalogue of responses to specific questions that relate directly to the indicators that underpin conceptual frameworks" (p. 118). Most of practitioners were language teachers who stood for "a substantial amount of knowledge and expertise in the field of CALL" (Levy, 1997, p. 118). One hundred and four questionnaires were completed by participants from 18 countries, concerning how a CALL author's language teaching and learning philosophy influence their way of working. Levy (1997) summarized variety of opinions from the questionnaires. His summary is illustrated as follows:

In CALL, languages are employed in context, and students are provided with significant feedback. Instruction initiates in the curriculum and is designed out of the practical instructional situation, and adapts the use of the computer to meet student needs. Computers are used as tools
for students to practice vocabularies on a large scale. The computer is intended for different tasks, including "enabling tasks" and "rehearsal tasks", and for access to data and descriptions of language. Instructional materials should facilitate exploration and discovery. Instructors can employ computers to compensate for class teaching.

Healey and Johnson (1995) offered some valuable suggestions on how to apply CALL. A summary of the major ideas is provided. Some of students are adept at drills; while others indulge themselves in real-world applications. In these situations, student cooperation in peers or in groups can help to accomplish a communicative effect in instruction. When practicing a simulation, each student in a group is committed to one task such as "note taking, calculating, keeping track of different variables and making specific decisions" (Healey & Johnson, 1995, p. iv). While operating a computer, instructors should read the screen first, then refer to the manual when they are confused. They should examine the software carefully prior to using it in class. With this fact in mind that they are not a computer programmer, instructors should be willing to offer opportunities to be assistants to those students who have better computer knowledge.

Those views on CALL teaching/learning philosophy and suggestions on CALL applications can fit well in the foreign
language teaching context in China. However, as instructors adopt them, they are required to take variety of student needs and complexity of teacher goals into account so as to achieve optimum quality of teaching. With the guidance of the CALL teaching/learning philosophy, CALL in China will certainly make progress.

**CALL Applications**

Computer-Assisted Language Learning (CALL) is viewed as "the search for and study of applications of the computer in language teaching and learning" (Levy, 1997, p. 1). CALL is an increasingly robust area in language teaching. Teachers have observed that computers have extraordinary capabilities to be used for their own instructional purposes. Some of the recent research results in computer applications in CALL facilitating language learning are presented.

**Tutorials**

Computer-delivered tutorials are chiefly used "to introduce new information to the learner in a way that closely parallels how teachers and texts often present new instructional content" (Schreck & Schreck, 1991, p. 473). There is difference between tutorials and basic drill and practice for the function of teacher in tutorials is supposed to supply new information, other than just offer follow-up activities as in basic drill and practice (Price,
Tutorial programs "imitate the human tutor" (Price, 1991, p. 35). Ideal tutorials "ask frequent questions of the learner and evaluate the responses" (Price, 1991, p. 35) while poor-quality computer-delivered tutorials frequently involve merely "page-turning activities" that make the learner passive (Schreck & Schreck, 1991, p. 473). Summaries and basic drill and practice parts can be integrated into tutorials; visuals, animation, or sound is frequently involved in the articulation of new information (Price, 1991).

**Basic Drill and Practice**

Basic drill and practice exercises belong to "the earliest" CALL uses and remain "a sizable proportion of available courseware" (Schreck & Schreck, 1991, p. 474). And around 50% of computer-aided instruction (CAI) programs to be used currently are categorized as drill and practice (Price, 1991). These exercises offer opportunities to make students become more adroit at "recognizing, recalling, or applying information" that has been acquired before (Schreck & Schreck, 1991, p. 474). Instructors establish programs by choosing and developing certain drill and practice materials for students to handle in this mode. The skills designed for practice must facilitate the accomplishment of "the minimal objectives" of the instruction (Stolurow, 1973, p. 19). Here the computer's function is "to follow up the instruction"
Drill and practice aim primarily "to transfer knowledge from short-term memory to long-term memory" and to help the student regain information at a future time (Price, 1991, p. 26).

**Simulations and Games**

A computer simulation or game concerns "a model of a real or imaginary situation in which the learner plays an active role in determining the situation's outcome" (Schreck & Schreck, 1991, 474). Simulations include machines, ecological systems, or societal systems, etc. The appropriately created simulation enable a learner to obtain insight in the process of operating the system (Orwig, 1983). Because it is learners who decide on the consequences of simulations, simulation programs make it possible for them "to experience things vicariously that would not be feasible otherwise" (Price, 1991, p. 45). Students acquire diversities of procedures or problem-solving strategies which are beneficial to different situations. One of the additional advantages of simulations and games for CALL is that they can "facilitate group discussions among participants" (Schreck & Schreck, 1991, p. 475). This well-focused activity enables a group of learners "to obtain huge incentive to communicate among themselves" as they endeavor to cope with a particularly different problem (Schreck & Schreck, 1991, p. 475). Thus, simulations are "potentially
the most powerful teaching technique" accessible from the computer (Orwig, 1983, p. 12).

**Text-Building Applications**

Text-building computer applications relate to "a wide variety of learner-computer interactions in which the learner's primary role involves changing, reconstructing, or creating text" (Schreck & Schreck, 1991, p. 475). Creating text can be widely used with the growth of the learner's English capability. The accessibility of courseware enables both the instructor and the learner to create their own text by selecting the sorts of manipulations that will generate "the most educationally appropriate individualized learning experiences" (Schreck & Schreck, 1991, p. 475).

**Assessment, Data Collection, and Analysis**

Computers are greatly useful in "collecting information about a learner's performance, storing it, and later retrieving it in usable forms" (Schreck & Schreck, 1991, p. 477). For years, instructors have exploited computers in formal language-testing "to generate items, to score tests, and to analyze both individual and group performance" so as to allocate a student a task of particular capability level (Schreck & Schreck, 1991, p. 478). It seems difficult to assess what achievement or problems might take place in the learning process. However, the computer can exert great potential in this aspect. The most frequently used type of
assessment is conducted to evaluate an individual student's knowledge and skill level in the particular field either prior to or after instruction. Besides, formative evaluation happening during the learning process helps instructors "revise their instruction to make it more efficient and effective" (Dick & Carey, 1990, P. 234).

Teacher Utilities

Teacher utilities mean that "the computer is used to produce class materials and/or to keep track of student progress" (Healey & Johnson, 1995, p. iv). This category generally includes grade book programs, crossword puzzle generators, and authoring systems. These programs enable busy teachers to design materials more quickly and conveniently (Healey & Johnson, 1995).

Overall, the description of the above CALL applications provide a basic framework of reference for language teachers to adopt in their academic practice. Concerning how to translate them into fruitful instructional reality, other issues should be taken account of such as the nature of the language to be taught, the teaching philosophy, the language input and output, the learning styles and experiences, role of the computer and teacher, the design of the materials, etc. Essentially, CALL applications, with the consideration of all those concerns, will help to make qualified teachers and create more innovative new learning experiences.
Capabilities of Computer-Based Technology

Some significant attributes of computer-based technology appeal to foreign language teachers particularly.

Learner control/Individualization. Computer-based instruction provide students with some control over "the rate and the sequence" (Heinich, Molenda, Russell, & Smaldino, 1996a, p. 235), for a computer program offers "multiple instructional paths, tailored to individualized needs" (Steinberg, 1991, p. 18). For instance, the fast learner, without the fear of being delayed, can get through a program as quickly as possible; the students who get into difficulty can adjust the learning pace to their own individual needs so as to acquire some extra practice in certain troublesome sections.

Special needs. Instructors can use much of the software for the child with special needs (Sharp, 1996). Being patient, computers can always repeat the same interpretation for remediation which is much beneficial to disabled learners. A particular communication board can be used to meet a child's spoken request (Sharp, 1996). With the use computers, instruction can be made more effective for the learners of special needs.

Visual appeal. "Color, music, and animated graphics" can give a realistic atmosphere; they also "appeal to drill
exercises, laboratory activities, simulations, and so on” (Heinich et al., 1996a, p. 235).

**Timelessness.** The student can be always involved in learning on the computer. Owing to the fact that computers do not need a rest or do not get tired, they become “a better tutor than a human” (Price, 1991, p. 5).

**Record keeping.** Computers can be used to keep record of student progress by calculating and storing information on the “amount of time spent with the program, the amount of material presented, student scores on testing, questions, and percentages of correct and incorrect responses” (Price, 1991, p. 5). By analyzing the data provided by the computer, instructors may identify easily the problems with student learning and their academic achievement.

All those capabilities have made foreign language instructors take great interest in computer-assisted instruction. Its enhancement of active student learning, its potential to enable teachers to better address students’ needs for individualization and its aid in developing students’ complex skills provide opportunities for teachers to achieve more efficient and more effective instruction and for students to learn many things better and more quickly than in a traditional classroom environment.
**Basic Criteria for CALL Materials Design**

Criteria for computer-based instruction can have a significant impact on CALL material design. Some of the basic criteria for computer-based instruction are presented. First, the program should use screens, color, graphics, and sound effectively (Price, 1991). Information should be presented in clear structural form. There should be a focus on the major parts of the presentation. Screens must not be cluttered with information for placing too much information on the screen may burden students excessively and placing too little on the screen may generate student "most challenging response being to click the mouse to move on" (Hoffman, 1996, p. 26). Color, graphics, and sound can be used "to enliven instruction, add realism and provide cues to the learners" (Price, 1991, p. 112). However, they should not be universally adopted except where they aid the interpretation of the message. Second, the language context should be "correct, authentic, and appropriate" (Garrett, 1991). The objectives of the instruction must be stated clearly and correctly. Otherwise, the learner may "become confused, discouraged, and frustrated" (Price, 1991, p. 110). Information should be displayed precisely and authentically without grammar, spelling, or punctuation errors on the screen. The new instructional materials should keep consistency with other learned programs and materials.
(Price, 1991) so that students can control the learning process and accomplish the instructional objectives smoothly. Third, personalized instruction should be used carefully. Using the student’s name to program the instruction can be significant, “especially with young learners” (Price, 1991, p. 111). But the student’s name should not be abused for this sort of activity “may erode the credibility of the exercise” (Hoffman, 1996, p. 26).

The above basic criteria for CALL material design are generally considered much beneficial to computer-based instruction. Since teacher-related factors are “the most important in determining the success of CALL materials development”; it is eventually language teachers’ responsibility to influence the choice and use of CALL materials (Levy, 1997, P. 231) for in most cases, language teachers are involved in assigning learning tasks to students and directing them to learn and practice the CALL materials. Hence, doubtlessly “CALL will largely be the result of the collective views of language teachers” (Levy, 1997, P. 231).

**CALL Applied to the Teaching Practice**

Many educators have agreed that “the computer is one more teaching tool (like blackboards, books, and tape recorders) that teachers can use according to their varied instructional purposes” (Healey & Johnson, 1995, p. iii).
Teachers can always access computer software either when they take the conventional way of teaching reading, writing, speaking, and listening skills separately or when they employ "the more holistic approaches that concentrate on processing language" (Christensen, Hammons, Mervill, Reynolds, Tolman, & Vincent, 1996, p. 278). As a great quantity of literature deals with how computers can greatly benefit writing instruction, the advantages of using computers to enhance writing in the target language are demonstrated.

Writing is one of the cognitive skills which requires plenty of practice to improve. Clearly, to facilitate the learning of cognitive skills effective practice environments should be created (Banks, Berger, & Pezdek, 1987). How the computer is used as a writing tool to provide an effective language learning writing environment is demonstrated.

Most teachers have realized that a word processor is particularly beneficial to teaching writing. Edwards, Havriluk, and Roblyer (1997) gave an elaborate definition of word processing:

Word processing, simply put, typing on a computer. The term word processor can refer either to a computerized machine set up primarily to do word processing (e.g., an electronic typewriter) or to a general-purpose
computer that can use word processing software. (P. 128)

The capability of a word processor enables students to type text on the computer keyboard, store the text in the computer memory in order that they may use it in future, edit whatever they have been written such as deleting and inserting sentences and paragraphs or shifting their position, check and correct spelling, suggest words by accessing a thesaurus, allow insertion of graphics, change style and appearance easily, and eventually print out a satisfactory copy. Thus, students feel that writing with a word processor has turned out to be enjoyable.

By learning to run word processing, students will improve their general computer literacy and benefit directly in terms of their class work for they can make corrections to word processing documents more quickly than they could achieve on a typewriter or by hand, and documents from word processing software look more elegant and professional than handwritten or typed documents.

Obviously, computers can be good tools in learning writing. However, "in a language learning environment, given the neutrality of computer tools, it is essential that students are able to seek and find advice on when and how to use the tools most effectively" (Levy, 1997, p. 208). Thus, it is advisable that teachers provide guidelines required
for student practice on computers. Without guidelines provided, students will need help from teachers. If such advice is not available, there is the threat that "tools will be used inappropriately" (Levy, 1997, p. 210).
The research evidence supports the benefits of the video and computer applications in language teaching classrooms. But when we apply the educational technology in the foreign language teaching in China, we must consider its current practical situation, that is, the theory of educational technology must fit into the needs of the particular circumstances in the Chinese educational field and the characteristics of the learning styles of the Chinese students (Li, 1996). Based on this perspective, and from the studies reviewed, two major implications can be drawn in order to produce learner success in foreign language study in Chinese universities.

First, instructors should actively identify the individual differences in learning styles through personal observations, through certain related tests, and even through contacting parents so as to cater to the instructional needs of all individual learners. Shichun Gui (cited in Li, 1996) claims that the foreign language students in China prefer to learn individually rather than in groups. This characteristic in their learning styles matches some of the features of individualization of CALL, thus providing evidence for the universal feasibility of implementing CALL in China. Qi Chen (cited in Li, 1996) also
states that the field dependent learners can learn better under the procedure-adaptive-controlled conditions whereas the field independent learners can do better under the conditions of learner-controlled software. Therefore, instructors must choose appropriate technologies and courseware according to the individual needs of different learners in order to achieve optimum effect for the individualization of CALL.

Second, foreign language instructors, by creating the optimal learning environment with educational technology, should motivate students in learning the foreign language to the greatest degree, and enable them to absorb knowledge, and practice skills in an agreeable, relaxed atmosphere. The Chinese foreign language students learn a foreign language in an environment where only their native language is used. So, most students have a sense of anxiety to some degree. There are two categories of sense of anxiety: (1) facilitating anxiety; (2) debilitating anxiety. The former provides motivation for learners to overcome difficulties while the latter makes a learner avoid taking new learning tasks. Without the sense of anxiety, one cannot learn a foreign language well. But if the sense of anxiety is too strong, it may also inhibit the learning performance. Thus, the sense of anxiety is considered an important factor in learning a foreign language. But CALL provides a means for
overcoming this problem by offering students appropriate courseware and by making students practice language skills in an optimal learning environment. Hence, students have less anxiety as that generated in traditional classrooms. We may say that CALL has the potential in eliminating the sense of anxiety in language learning.

To conclude, the research reviewed in this paper provides ample evidence that educational technology can have a significant impact on language learning. Educators firmly believe that the effective integration of technology into the language learning classroom will certainly lead to the creation of a rich instructional environment and the prosperous growth of the Chinese educational cause.
References


