THE EFFECTS OF USING COMPUTERS AS A TOOL FOR PROMOTING ACHIEVEMENT AND INTEREST FOR AMERICAN-BORN CHINESE CHILDREN'S LEARNING CHINESE AS A SECOND LANGUAGE

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Department of Counseling, Educational Psychology, and Special Education

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ABSTRACT

THE EFFECTS OF USING COMPUTERS AS A TOOL FOR PROMOTING ACHIEVEMENT AND INTEREST FOR AMERICAN-BORN CHINESE CHILDREN'S LEARNING CHINESE AS A SECOND LANGUAGE

By

Yeong-Ming Jong

This study was undertaken to investigate the effects of using computers as a tool for promoting achievement and interest for American-born Chinese children learning Chinese as a second language. A background questionnaire, an interest scale, a pretest, and a posttest were used to collect the data.

Interest in learning Chinese in the Chinese school increased significantly for subjects in the experimental group over the research period. No significant difference was found across grade levels in terms of interest change or interest in continuing to learn Chinese. There was no evidence that students learned more in the Chinese school through the use of computers than through non-computer learning.

Even though speaking Chinese at home had an effect on subjects obtaining higher average scores, it did not influence the same group of subjects improving their pretest-posttest difference scores. Subjects with strong parental concern had higher average scores but did not have higher pretest-posttest difference scores, whereas subjects with not-so-strong parental concern had higher pretest-posttest difference scores.

Dedicated to my parents, my parents-in-law,
my wife, and my three sons
for their patience
and support

ACKNOWLEDGEMENTS

The members in my dissertation guidance committee are important to this research and the dissertation writing. Dr. Bohnhorst is more an elder than an advisor to me. His critiques on the proposal and the dissertation pushed me to pursue high quality in organizing this research and writing the research results. Dr. Bresnahan has been very supportive in my studying and research and made precious comments on my writing. I learned the spirit of never giving up for endeavoring high quality of a scholastic research and writing from Dr. McLeod. I could not have finished my doctoral program without Dr. Bell's help and support.

I would like to thank teachers and principles in the Lansing Chinese School and the Overland Park Chinese School for their assistance to the research. My editors, Dr. Diane Gensaw edited the proposal, Mrs. Sue Miller edited the first draft of the dissertation, and Ms. Toni Granse edited the final draft of the dissertation. Their help is much appreciated.

Finally, I cannot leave this page without mentioning Mr. S. M. Hwang. His spiritual and financial support made the research possible.

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CHAPTER I

INTRODUCTION

Background

People from most cultural groups, upon entering a country such as the United States, have encouraged their children to learn the language of the country from which they emigrated (Li, 1993). Usually, immigrants in the United States hope to communicate with their children in their mother tongues. Parents of the immigrant families believe that a bilingual environment can benefit their children's lives in the United States. They expect their children to learn their mother tongue and traditions through learning the language. For Chinese immigrants, similar patterns occur. They like to send their children to American public schools to learn English, and to send their children to Chinese schools to learn Chinese.

More than 1,000 Chinese-language schools currently are operating in the United States. Yet most American-born Chinese children do not want to attend Chinese schools when they are given a choice. According to Fan (1993) these youngsters believe that it is unnecessary for them to learn Chinese in an English-speaking environment, and they are unable to think and express themselves in Chinese as comfortably as they do in English.

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Furthermore, American-born Chinese children are accustomed to the curriculum design and teaching methods of the English-speaking schools they attend everyday. Thus, when their parents send these young American-born students to Chinese schools, it seems likely that they would tend to be skeptical of the teaching methods, curriculum, learning environment, and homework in the Chinese schools (Wong, 1993).

Statement of the Problem

In a study based on the 1990 United States Census data, Li (1993) found that, when American-born Chinese children grow up, they lose their motivation to learn the Chinese language. The implication of Li's research findings is that, if this pattern continues in subsequent years, children in Chinese immigrant families become less willing to speak their parents' language when they grow up (see Figure 1). However, when these individuals are about 30 years old, their willingness to speak the Chinese language returns and continues to grow. Figure 1 illustrates the decline and subsequent rise of Chinese speaking among American-born Chinese.

A rise in Chinese speaking begins at age 20 because most of these individuals attend college and take Chinese-language courses to fulfill the second-language requirement. According to Li's research, at the age of 25 the slope goes down again, which could be because these individuals discover that the Chinese language is not useful in their employment. The slope rises again at the age of 30, perhaps because they think a knowledge of their cultural identity is important as they settle down in a multicultural society (Li, 1993).

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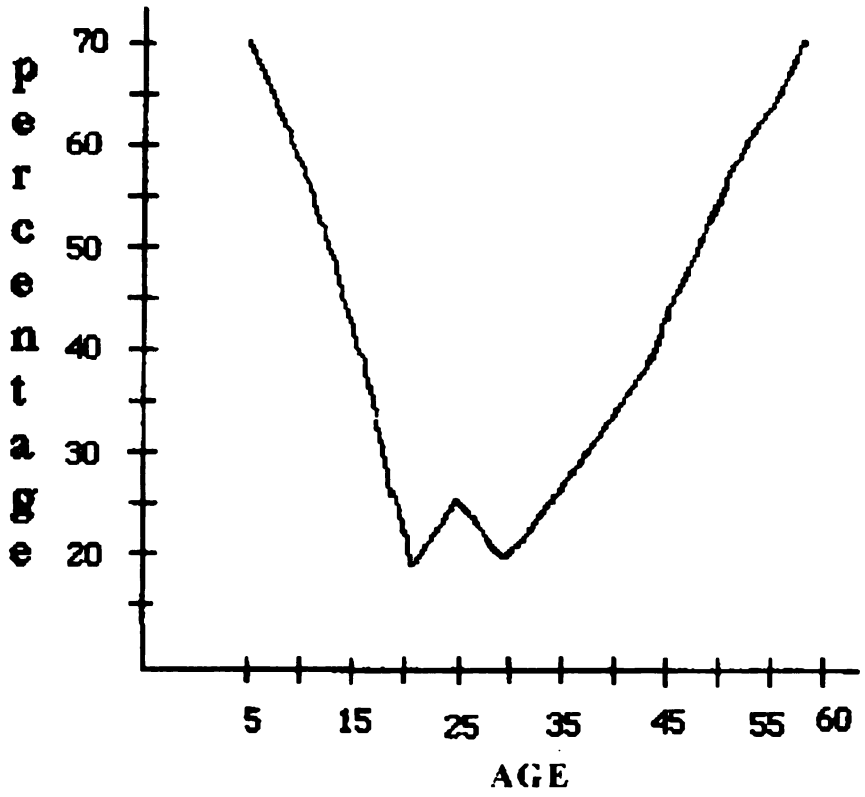

Figure 1. Chinese-Speaking Ratio Among Chinese Immigrants
(Source: U. S. Census 1990)

Teaching the Chinese language to American-born Chinese children is most effective when these children are young (four to seven years old) and when the bond between parents and children is strong (Fan, 1993; Wong, 1993). As these children grow up, they gradually show an unwillingness to speak their parents' mother tongue, and hence lose the motivation to learn Chinese (Fan, 1993; Wong, 1993). American-born Chinese children's unwillingness to learn the Chinese language can be exacerbated if the Chinese school does not offer them a meaningful learning environment. However, it may be possible to improve that learning environment by providing a meaningful learning tool such as the

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computer. In this yet to be proved environment, students may be more willing to learn the Chinese language.

Research on effects of using computers as a learning tool in teaching Chinese as a second language to American-born Chinese children is scant. More studies in this area are needed, in order to explore the efficacy of using computers as a tool for teaching Chinese to American-born Chinese children in the United States. To address this problem, this study was undertaken to investigate the effects of using computers as a tool for promoting achievement and interest for American-born Chinese children's learning Chinese as a second language.

Purposes of the Study

The researcher's purposes in this research were (a) to examine the effects of using computers as a tool in promoting American-born Chinese children's achievement and interest in learning Chinese as a second language, and (b) to determine whether or not there are relationships between using computers as a tool in learning the Chinese language and the variables of age and language spoken with parents at home.

More specifically, the researcher attempted to determine whether computers can be used as a learning tool to aid in American-born Chinese children's acquisition of the Chinese language. Further, the writer investigated the effects of using the computer as a learning tool to enhance American-born Chinese children's interest in learning Chinese. Finally, the effects of using computers as a learning tool were compared with the effects of non-computer learning.

Importance of the Study

This study is important for two reasons. First, cultural identity is important for immigrants and their descendants to maintain a healthy life style in a multicultural society (Jan, 1993; Wang, 1991). For American-born Chinese children, learning Chinese is helpful in retaining their Chinese identity because the traditions can be passed on through language learning (Fan, 1993; Wong 1993). Second, language learning is important for incoming cultural groups because of the need to maintain one's cultural identity in a multicultural society such as the United States (Jan, 1993). For these reasons, it is important to foster American-born Chinese children's interest in learning the Chinese language.

Research Questions

The following questions were posed to guide the collection of data for this study:

1. Does using the computer as a tool to learn Chinese promote interest in learning among American-born Chinese children across the grade levels?
2. Do American-born Chinese children learn more by using computers as a tool for learning Chinese, as compared to those not using computers?
3. Does speaking Chinese at home affect American-born Chinese children's learning in the Chinese school?
4. Does parents' concern influence American-born Chinese children's learning in the Chinese school?

Research Hypotheses

The following null hypotheses were formulated to analyze the data collected for this study:

Hypothesis 1a: There is no difference in promoting interest in learning the Chinese language between American-born Chinese children who use computers as a learning tool and those who do not use computers.

Hypothesis 1b: There is no difference between different grade levels in promoting learning interest when using computers as a learning tool.

The data for testing hypotheses 1a and 1b were collected by means of the learning interest questionnaire (Appendix E) and the background questionnaire (Appendix A).

Hypothesis 2: There is no difference in learning between American-born Chinese children who use computers as a tool for learning the Chinese language and those who do not use computers.

The data for testing this hypothesis were collected by means of a pretest and a posttest (Appendices C and D).

Hypothesis 3: There is no difference in learning the Chinese language in the Chinese school between American-born Chinese children who speak Chinese at home and those do not speak Chinese at home.

The data for testing this hypothesis were collected through the background questionnaire, the pretest, and the posttest (Appendices A, C, and D).

Hypothesis 4: There is no difference in learning the Chinese language between American-born Chinese children with strong parental concern and those with not-so-strong parental concern.

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The data for testing this hypothesis were collected through the background questionnaire, the pretest, and the posttest (Appendices A, C, and D).

Delimitation

This research was undertaken to investigate the effects of using computers as a tool for improving American-born Chinese children's achievement and interest of learning Chinese as a second language. The study was delimited in the following ways:

1. The computer was used as a learning tool to help students practice phonetics, recognize Chinese characters, and make sentences. Classroom teachers were responsible for the regular Chinese-language instruction, including character recognition, translation, pronunciation, conversation, reading, sentence making, writing, and cultural activities.
2. Only the traditional form of written Chinese characters was used in this study. The traditional written form is the one that the Chinese have used for more than 2,000 years.
3. Chinese language has two written formats: top-down and left-right. To type and print out Chinese characters with English text for this research, the left-right format was used throughout the research.
4. The researcher did not focus on practicing pronunciation when using computers as a tool to help American-born Chinese children learn Chinese as a second language.

Limitations

The following limitations might have affected the outcome of the study:

1. The computer portion of this research lasted for 10 weeks. Students' performance on the tests might have been better if the research period had lasted longer.
2. It is possible that differences between the experimental group and the comparison group were due to the novelty of using computers as a learning tool.
3. The sample size for this study was small. The sample size was limited by accessibility of subjects, as well as financial constraints.
4. Because the subjects were not randomly selected, the findings from this research can be generalized only at great risk.
5. Younger parents may have more energy or ambition to push their children to learn more, whereas older parents may not take their children's learning as seriously. The effect of parental age on learning was not investigated in this research.
6. Some parents are talkative, whereas others are not. This personality difference was not analyzed in the present research.
7. In some families, the father is dominant and the mother just follows the father, or vice versa. These different family climates may influence children's learning. This type of difference was not examined in the current study.
8. Single-parent households may have a different influence on student interest in learning Chinese than two-parent households. The present research did not focus on this type of difference.

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9. A threat to internal validity is related to the controls of the research. Because the research was conducted in two different Chinese schools, there were differences among teachers. Although the textbooks and the Chinese characters and phrases that were taught were the same, teaching methods may have differed from teacher to teacher. It may be that teachers in one school were more experienced than teachers in the other schools. These factors of differences between or among teachers may have affected students' learning, but no effort was made in this study to measure or control these factors.

Definition of Variables and Terms

The following variables and terms are defined in the context in which they are used in this study:

Independent Variables

Grade level refers to the different grade level of students in the Chinese schools included in the study. The first-level class includes kindergartners and first graders, the second-level class includes second and third graders, and the third-level class includes fourth and fifth graders. The effects of using computers as a tool in promoting interest in learning the Chinese language may differ among American-born Chinese children in various grade levels.

Language spoken at home refers to the language that American-born Chinese children and their parents use at home. Some families allow only Chinese be spoken at home. In some families, parents speak Chinese to the children, whereas children respond in English. In other families, parents speak English to children most of the time.

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Using computers as a tool to learn Chinese refers to the use of computers as a learning tool in the Chinese schools. In this research, computers were used to practice Chinese phonetics, Chinese character recognition, sentence making, and writing. Using computers as a tool to learn Chinese may influence American-born Chinese children's interest in learning Chinese language.

Dependent Variables

Averages of the pretest and posttest refers to the averages of the pretest and posttest scores.

Difference between pretest and posttest refers to the difference arrived at by subtracting for each individual the pretest score from the posttest score.

Interest in learning Chinese may be observed if an American-born Chinese child likes to learn or complains about learning Chinese in the Chinese school before using computers as a learning tool, and then has the opposite reaction afterward. Interest in learning Chinese may increase or decrease as a result of using computers as a learning tool in the Chinese school.

Pretest scores refers to test scores at the beginning of the research.

Posttest scores refers to test scores at the end of the research. The subjects' posttest scores are compared to their pretest scores. The results may vary depending on whether or not students used computers as a learning tool in the Chinese school and/or spoke Chinese with their parents at home.

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Related Terms

American-born Chinese children refers to second- or third-generation Chinese immigrants born in the United States who are enrolled in the Chinese schools.

Chinese characters are logographic symbols composed of various strokes. Most Chinese characters are monosyllabic morphemes. Each character forms a separate symbol and is able to stand alone, with a distinct meaning (Hor, 1991).

Chinese schools are places where the Chinese language and culture are taught in the United States. A Chinese school meets on the weekend, usually on Saturday or Sunday afternoon from 1:00 p.m. to 4:00 p.m. Most Chinese schools in the United States do not have their own buildings, but rather rent classrooms from local public schools.

Computer-Assisted Instruction (CAI) refers to the use of computers to assist in teaching.

Computer-Assisted Language Learning (CALL) concerns the use of computers to assist in second-language learning.

Continuing motivation reflects an ongoing willingness to learn. Individuals display continuing motivation when they return to a learning activity at a later time without external pressure to do so. Continuing motivation has strong implications for long-term, out-of-school learning (Maehr, 1976).

Extrinsic motivation in second-language learning refers to learning a second language because it will be useful in college and in future employment (Ramage, 1990).

Intrinsic motivation in second-language learning refers to general interest in thoroughly learning a second language, including reading,

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writing, and speaking, as well as interest in increasing one's knowledge about the culture (Ramage, 1990).

Learning is "an active, constructive process whereby the learner strategically manages the available cognitive resources to create new knowledge by extracting information from the environment and integrating it with information already stored in memory" (Kozma, 1991).

Lansing Chinese School is located in a university city. Students enrolled in the Lansing Chinese School are from the Chinese community in and around Michigan State University. Students attend the Lansing Chinese School on Sunday afternoon, from 1:00 pm to 3:30 p.m.

Overview

Chapter I contained the background of the study, a statement of the problem and purposes of the study, importance of the research, research questions and hypotheses, delimitations and limitations, and definitions of variables and terms used in the study.

Literature related to the study is reviewed in Chapter II. Topics of interest include motivation in second-language learning, using computers as a learning tool, and computer-assisted language learning.

The methodology used in carrying out the study is explained in Chapter III. The research design, research questions, and variables for each question are set forth. The population and sample are defined, and the treatment and classroom procedures are described. Instrumentation and data-collection and data-analysis techniques were discussed.

Results of the data analyses are presented in Chapter IV. A discussion of the major findings, conclusions drawn from the findings, and recommendations for further study are included in Chapter V.

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CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter contains a review of the literature on three topics pertinent to this study: (a) motivation in second-language learning, (b) use of computers as a learning tool, and (c) computer-assisted language learning. This review provides the basis for investigating the use of computers as a tool to promote American-born Chinese children's interest in learning Chinese as a second language.

The first section of the review of literature, motivation in second language learning, serves two purposes: (a) determining the reasons immigrant children lose interest in learning their home languages, and (b) seeking ways to increase immigrant children's interest in learning their home languages.

The second section of the review of literature, using computers as a learning tool, focuses on how computers can be integrated into teaching to increase students' interest in learning and improve their attitudes toward school.

The third section of the review of literature, computer-assisted second language learning, contains a discussion of how computers can be used in second language learning.

Motivation in Second Language Learning

As shown in Li's (1993) research and in Figure 1 (Chapter I), second-generation Chinese immigrants speak less and less of their home language when they grow up. Both Fan (1993) and Wong (1993) concluded that, in general, American-born Chinese children are not willing to attend Chinese schools. What causes children's unwillingness to speaking their home language? Does this happen only to Chinese immigrants? Is there a way to promote American-born Chinese children's interest in learning the Chinese language? The first part of review of literature is an attempt to answer the preceding questions.

Saracho (1987) reported that, at first, children from families who immigrated into the United States from Latin America became confused when they experienced differences between the two languages and cultures (the language and culture at home versus the language and culture in the American schools) (p. 53). Later on, these children denied their language and culture, pretending that their language and culture were the same as the school's.

Palmer (1987) indicated that it is difficult to motivate young American Indians to learn their native language because of the difficulty of the language and its limited usage beyond the reservation. "To gain their participation, instructional materials must have intrinsic interest beyond their value in teaching language basics" (p. 37).

Gardner and Lambert (1972) examined at the language-learning process from social psychologists' point of view. They anticipated that success in mastering a second language depends not only on one's intellectual capacity and language aptitude but also on "the learner's

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perceptions of the other ethnolinguistic group involved, his attitudes towards representatives of that group, and his willingness to identify enough to adopt distinctive aspects of behavior, linguistic and nonlinguistic, that characterize that other group" (p. 132).

Gardner and Lambert defined a person reflecting a sincere and personal interest in the people and culture represented by the other group as one with an integrative orientation. The learner's motivation for language study is determined by his or her attitudes toward and readiness to identify with the other people and culture and by his or her orientation to the whole process of learning a second language. An integrative orientation better sustains the long-term motivation needed for the demanding task of learning a second language. For serious students who master a second language, a conflict of identity might arise as they become skilled enough to become accepted members of the new cultural group.

Normally second-language learners already have a perfectly good language with which to communicate his or her needs; hence, they need more extrinsic motivation to learn the language—to pass an examination and/or to please a teacher or parents. Situations like this cause undesirable effects in second-language classroom practice and learning behavior (Dodson, 1978; MacNamara, 1973).

Jordan (1941) indicated that, among English students ages 11 to 15, attitudes toward the study of French declined over three grade levels. Second- and third-year students thought that learning the language took a long time which was not worth the effort because they did not see the utilitarian value of learning French. In two parallel cross-sectional studies, Jones (1949, 1950) found that students'

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attitudes toward learning Welsh as a second language declined from year to year over a four-year period, with a sharp decline at the fourth-year level. Like Jordan, Jones found that the two main reasons for the decline in learning Welsh were difficulty and lack of utility.

In a study of learning French as a second language in the English schools, Burstall, Jamieson, Cohen, and Hargreave (1974) found that elementary school students generally became more negative in their attitudes toward learning French from their first to their third year of study. In particular, older students expressed less interest in learning foreign languages, stressed the increased difficulty of learning French, thought that other school subjects were more valuable, found the repetition involved in language learning boring, and saw less future advantage in studying French.

Gardner (1985) had similar findings from 15 samples of Canadian students in grades 7 to 11 who were studying French for two consecutive years. In his research, "motivation, attitudes toward the learning situation and integration decrease from year one to year two" (p. 96). Gardner suggested that older students, having had more experience with learning the language, had experienced greater variation of success and failure and were more objective in their evaluations. In Gardner's research, motivation had a causal influence on students' success in learning a second language.

Kraemer and Zisenwine (1989) investigated students' attitudes and motivation toward second language learning over an extended period of time. Their sample included 1,200 children in grades 4 through 12 studying Hebrew in a private Jewish school system in South Africa.

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Results showed that students' positive attitudes decreased over the nine grade levels, supporting the research findings noted above.

As indicated earlier, integrative motivation stems from a desire to understand the language and culture of another group for the purpose of interaction (Gardner & Lambert, 1972). Positive attitude and integrative motivation facilitate the learning of a second language. Integrative motivation promotes proficiency and is correlated with higher achievement in the second language (Gardner, 1985; Gardner, Day, & MacIntyre, 1992; Gardner & Lambert, 1972).

Ramage (1990) investigated whether motivational and attitudinal factors can be used to predict high school students' continuation of foreign language study beyond the second level. She stated that the intrinsic motivations associated with students' continuing study of a foreign language were interest in increasing one's knowledge about the target culture and interest in learning the target language thoroughly, including reading, writing, and speaking. Extrinsic motivations associated with continuing study were taking a particular language because of its usefulness in college and its usefulness in future employment. Ramage concluded that developing students' intrinsic interest (proficiency in the language and its benefits) in second-language study promoted continuation of second-language learning. She suggested that emphasis be placed on developing students' intrinsic interest in foreign language study to encourage continuation, but not to the exclusion of extrinsic motivation.

Deci and Ryan (1980) proposed that positive feedback increases intrinsic motivation whereas negative feedback decreases such motivation. Teachers can be educated to use teaching styles that

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promote personal causation, which has been linked to intrinsic motivation (Cohen, Emrich, & deCharms, 1977). To involve students, teachers in second-language classrooms should focus on natural and normal communication (Ramage, 1990; Rivers, 1976). In providing feedback to students, teachers should respond to their competence in communicating meaning. "In this way, students are more likely to become involved in the language and culture itself and will want to learn the language for the purpose of communicating in it. In short, they will become intrinsically motivated or interested in learning the language for its own sake" (Ramage, 1990, p. 216).

Skehan (1991) proposed a general model to organize the different influences of motivation (see Table 1). In Table 1, the dimensions of the learning relationship (within the learning context versus the results of learning) are contrasted with the relationship to the individual (inside vs. outside). Four cells are accordingly generated. Materials/teaching embraces those influences on the motivation of students that are the consequence of the instructional context. One assumes that different approaches to teaching may have different effects on the motivation of students.

Table 1: Influences on motivation

	Within the Learning Context	The Results of Learning
Outside the Individual	Materials Teaching	Constraints Rewards
Inside the Individual	Expectations Success	Goals

Source: Skehan (1991), p. 281.

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In contrast the lower row of the matrix is concerned with psychological influences within the individual. Within the learning context, expectations and success concern the way motivation may be caused by the satisfaction from doing well, and also by the anticipated satisfaction from doing well. Here, Skehan pointed out that motivation does not cause success, but simply follows it. Finally, the goals cell reflects those attitudes and beliefs within the individual that cause action and effort.

In the study of motivation in language learning, most of the emphasis has been placed on the study of goals. Relatively little research has been conducted on the effects of different materials and teaching techniques on the motivation of students. Nor has there been much research into the effects of manipulating constraints and rewards (Skehan, 1991).

Johnson (1988) concluded that a major part of teaching a second language involves establishing the social conditions that promote students' meaningful and purposeful use of that language. "Empowering second language students to serve as teachers for their peers is one way to create functional and successful second language learning environments," he noted (p. 161). Johnson stated that the teacher's role in structuring such environments is critical because, in this case, teachers should push students "to use language to do a variety of things while at the same time setting up the conditions so that children will experience success" (p. 161).

Kenning and Kenning (1990) stressed that it is not sufficient for the teacher to set up suitable physical conditions. He or she must also establish a cordial atmosphere for second language learning. The

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teacher-as-motivator plays "the single most important role" in second-language learning (p. 113). Kenning and Kenning recommended that teachers encourage students in the second-language classroom. Such encouragement includes, "a sympathetic attitude, not demanding beyond the students' capabilities, not overcorrecting, [and] praising what has been well done" (p. 113).

When a second-language teacher plays the role of facilitator or motivator, he or she ensures that students in the class get things to do that are relevant and enjoyable (Higgins, 1988). The teacher plays another role as well, that of a linguistic model. The teacher's language may be the only source from which students are learning. Thus, "the teacher acts as demonstrator in very much the same way as the sports coach, showing how things are done and how the right way works better than the wrong way" (Higgins, 1988, p. 56).

Li (1984) reported that cultural differences also influence language teaching and learning. He stressed that teaching Chinese as a second language entails finding out not only what should be taught, but also how the teaching can best be done. An effective teacher pays attention to cultural differences and will teach better if he or she possesses "empathy and a clear perception of the cross-cultural learning/teaching experience" (Li, 1984, p. 16).

Chappell (1990) stated that students learn a second language most efficiently when that language is real and when it serves communicative ends. "Language learning is most efficient when the task is stimulating and real. Language learners learn best when the context, situation and content are authentic" (p. 44). When students are learning to write Chinese characters, the effort and time required to master a large

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number of characters discourages many and reduces their confidence in using the written language. First, there is the difficulty of learning to recognize and write the shapes of the strokes. Another level of difficulty is encountered when attempting to put these strokes together in a recognizable composition. (p. 44).

Wang and Thomas (1992) suggested that successful long-term retention of a Chinese ideograph such as nest may be expected if students think of the mnemonic image themselves. "Instruction in the use of mnemonic strategies should emphasize the ability of learners to discover and apply their own mnemonic cues. . . . A strict reliance on teacher-supplied mnemonics can produce immediate benefits in the classroom, but long-term advantages may prove more elusive." (p. 374).

Bi (1989) reported that, in learning Chinese, it is helpful for nonnative speakers to understand the cultural differences because it helps them choose the correct expression for the appropriate contexts. If students learn how to express themselves accurately, they gradually gain confidence and do not feel like they are bumping into a wall when speaking Chinese.

Chu (1990) stated that learning Chinese involves developing four types of abilities: listening comprehension, spoken expression, reading comprehension, and written expression. Therefore, teachers of Chinese need to make a commitment to help students attain these functional goals. To accomplish the functional goals, the teacher has to introduce the Chinese language as it functions in real life. "The language must be presented with realistic situational backgrounds and cultural contexts" (p. 94).

Summary

From previous studies, it is clear that children are reluctant to learn a second language when they grow up. That is because they do not have to use the second language in their daily living, and they can survive without learning a second language in the society in which they reside. The problem of low motivation occurs not only with Chinese immigrants in the United States but also with other immigrant populations.

Previous researchers have found that motivation has a causal influence on success in learning a second language. A student's perception of the target language's ethnic group also influences second language learning. In learning a second language, it is helpful if a student is willing to adopt the cultural features recognized by members of the ethnic group who speak that language. Intrinsic motivation is associated with interest in learning a second language. Intrinsic interest in second language learning is likely to be heightened by teaching about the language in addition to teaching the structure.

Teachers play an essential role in encouraging students' learning a second language. Teachers should focus on natural and normal communication and provide feedback for students, responding to their competence in communicating meaning. In this way, students are more likely to become involved in the language and culture and will want to learn the language for the purpose of communicating in it.

Computers as a Learning Tool to Enhance Learning

Do computers help in learning? Are computers helpful to promoting intrinsic motivation? What should teachers do with computers in the

classroom? This part of the review of literature focuses on using computers as a tool in learning a subject.

A report from the Ministry of Education of Ontario (Larter and Fitzgerald, 1983) stated that microcomputers are seen as having a wide range of benefits for education. The uses and perceived benefits include the following:

1. "Microcomputers motivate and instil confidence. Most pupils are highly motivated to work on micros; they find the machines friendly, nonthreatening and controllable" (p. 81).

2. "Microcomputers are quick and easy to use. Pupils like the idea of 'pushing buttons' instead of using pencil and paper. It is not only more fun, but it is much less laborious and considerably faster. Erasures can be executed in a flash, and new ideas entered in a clean, neat fashion" (p. 83).

3. "Microcomputers are fun. Children tend not to see activities involving microcomputers as work, but instead regard them as entertaining and fun. They consider the work they do on the machines to be part game and part instructional" (p. 84).

4. "Microcomputers can be used as rewards. Given that pupils have such positive attitudes towards and interactions with microcomputers, it is not surprising that the machines can be used as very effective rewards" (p. 84).

5. "Pupils concentrate on microcomputers. Teachers, including primary and special education teachers, reported that pupils concentrate intensely on microcomputers and that their attention spans are longer when they are working with the machines than when they are working with activities" (p. 85).

6. "Microcomputers develop thinking skills. . . . It develops problem-solving skills and the ability to think logically and that many programs require a great deal of reasoning and forethought. . . . It helps pupils learn how to plan and organize. . . . This is more important than being stuffed with facts" (p. 85).

7. "Microcomputers are challenging. Children like to compete with the machines to get all the answers right and often compete with themselves to improve their scores" (p. 85).

8. "Creative writing can be done on microcomputers" (p. 86).

Thomas (1991) stated that teachers should interact actively with their students. Education means promoting the interaction between the mind and external experience so that each student internalizes the richness of ideas. Hence, one reason the computer is destined to be an important factor in human learning is "interaction" (Lin, 1985, p. 37). Ross and Morrison (1989) conclude that, "Although media do not directly affect learning, they serve as influential moderating variables through their effects on learner attributions and their differential properties for conveying instructional strategies" (p. 29).

Steinberg (1984) emphasized that the computer can be used as a system for delivering knowledge. The computer is a viable and unique tool for the purpose of learning to learn.

Kinzie and Sullivan (1989) investigated the influence that the availability of subject matter on computers has on student motivation. One of their findings was that students' motivation to study particular subject matter was enhanced by making the subject matter available on the computer (p. 42). The results revealed a strong positive effect of using computers as learning tools for continuing motivation (Kinzie &

Sullivan, 1989; Seymour, Sullivan, Story, & Mosley, 1987). This finding supports the notion that students perceive that they learn more when using computers (Krendl & Liebeman, 1988; Ryser, 1990). One possible explanation is that computers may have more intrinsic appeal than textbooks and other paper-based instructional materials, much as television has a greater overall appeal than do newspapers (Levin, Glass, & Meister, 1989).

Clark (1983) contended that the increased motivation associated with computers is due to a novelty effect, which will diminish as users become more familiar with the medium. He pointed out that, in studies of medium effects, medium was confounded by instructional method and context, and that novelty effects were also evident.

Students enjoy working on the computer and spending time on it "because the computer readily provides optimal challenges" (Higgins, 1988, p. 38). Therefore, it may be inaccurate to talk about the computer supplying motivation. "The motivation is present all the time. Instead, it is the exigencies of mass teaching that are supplying demotivation. Looked at in this way, . . . the task is not to enhance motivation, merely to reduce demotivation to the point where learners can set about finding their challenges" (p. 38).

Johnson (1991) stated, "It is not the computer itself that affects interaction. Rather, factors that affect interaction are the nature of the tasks teachers devise and the way that teachers organize classroom interactions centered around computer work or mediated through the computer" (p. 77) Pacey (1990) recommended that teachers should look for innovative ways of using technology to restructure their classrooms for improving learning. He encouraged educators to reflect on what they

are doing to promote language learning in their classrooms and to raise their awareness about the use of technology in language development. He said,

> "Teachers must establish an environment which fosters language learning, to create opportunities for interaction . . . . Their initial concerns should be about how to foster reading, writing and speaking processes, how to motivate children to learn language, how to help writers develop ideas, rather than how to use the new technologies. . . . The learning tasks have been structured so that they promote meaningful learning for the students" (pp. 684–685).

In Dalton, Hannafin, and Hooper's (1989) research, the performance and attitudes toward instruction of learners working individually on a computer–based sex education lesson were compared with those of learners working cooperatively in dyads. The researchers found that using computers as a learning tool, combined with small–group learning, offered considerable potential. However, this potential was not without limits. Effectiveness was apt to be influenced by a variety of factors such as instructional method, student ability, and gender.

Hooper and Hannafin (1989) investigated the effects of small–group composition, student ability, and learning accountability on achievement, interaction, and instructional efficiency during computer–based learning. They found that small–group learning overcame many of the potential pitfalls of isolation while improving students' achievement. The authors concluded that small–group learning offers considerable potential for the cognitive, affective, and fiscal benefits of computer–based learning.

In their meta–analyses of 101 CAI research studies, Kulik and Kulik (1987) found that "students generally learned more in classes when they received help from computers" (p. 224). They wrote, "Computer

based instruction has raised student achievement in numerous studies. It has given students a new appreciation for technology and has had positive effects on students' attitudes toward schools and teaching" (p.226).

Nevertheless, Williams and Brown (1990) claimed that most studies on CAI have had serious flaws in their designs. They stated that one must be careful in interpreting the results of meta-analyses with regard to the effect of CAI on learning because

> "almost all of the research syntheses include computer applications which are in addition to regular classroom instruction compared with regular classroom instruction alone. . . If one looks separately at the studies categorized as 'tutorial' in which the computer is used as a partial substitute for conventional instruction one finds that out of 50 studies, only 16 had an effect greater than .40 (the standard which some researchers believe to represent practical significance), and 16 tutorial studies had negative effect sizes. How successful is an experimental treatment when half [of] the studies yield negative results?" (p. 217)

Edwards, Norton, Taylor, Weiss, and Dusseldorp (1975) concluded that the effectiveness of CAI depends on how it is used in relation to instruction. When CAI is used as a supplement to traditional instruction, it is "more effective than normal instruction" alone in bringing about gains in achievement (p. 147), whereas achievement results are mixed when CAI is substituted for traditional instruction. "Several studies have shown that even though CAI does not always result in greater achievement, the time it takes students to learn is reduced" (p. 149).

Rocklin et al. (1985) found that combining computer-based instruction and cooperative learning allows one to take advantage of the strengths while minimizing the weaknesses of the two training-delivery technologies. Computer-based instruction

> ". . . provides an economical source of content and process expertise. The computer can also be programmed to efficiently control, monitor and reinforce the flow of learning activities. In addition, the training can be efficiently tailored to the learner's specific needs based on pre-training assessments and intra-training responses. Finally, the computer can unobtrusively and inexpensively collect data as the training proceeds." (p. 68)

"Cooperative learning, which involves two students working together in an orchestrated scenario, is particularly strong in the areas in which computer-based instruction is weak" (Rocklin et al., 1985, p. 68). Students can read and evaluate each other's productions. The interaction between students provides an opportunity for each to observe and imitate the other's processing.

Hawkins, Sheingold, Gearhart, & Berger (1982) stated that students in elementary classrooms are more likely to collaborate with each other when they work with computers, as compared to their interaction over other classroom tasks. These researchers also found that, when compared with other work, the computer context is the one in which children most consistently identify their peers as resources for help.

Summary

Researchers have found that students generally learn more in classes when they receive help from computers. Students have been found to prefer computers as a learning tool over other types of educational media. Students have reported an increase in positive attitudes toward school and subject matter when instruction is presented through computers.

Using computers as a learning tool also has positive motivational effects. Learning through computers has positive influences on students' intrinsic motivation. Teachers can improve their instruction by using computers to assist them in achieving their teaching

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objectives. In addition, learning through computers is most effective when two students work together on the computer.

Computers can provide support for a variety of cognitive learning styles, which match different learners with different learning strategies. When students see consistent progress using computers, intrinsic motivation starts to develop. When used as a learning tool, computers are useful in performing routine tasks, enhancing human creative skills, saving time, and preserving intellectual energy (Adams, 1988). Learning through computers is attractive to students, partly because such learning is interactive and partly because of the allure of the technology.

Computer-Assisted Language Learning (CALL)

Can computers help in learning a second language? What kinds of effects do computers produce in second-language learning? How should second-language teachers use computers for teaching? This part of the literature review is intended to answer the preceding questions concerning using computers as a tool in second-language learning.

Fisher (1983) found that using computers as a learning tool was almost always effective in the areas of science and foreign language. This finding appeared to be valid regardless of the age of the learner, the kind of computer used, or the type of test used to measure achievement.

Thrush and Thrush (1984) stated that computers can be an extremely powerful educational tool, offering individualized attention and allowing students to work at their own pace. They noted that "foreign

language teachers who have used the computer to assist in instruction report a variety of positive outcomes" (p. 24).

Rézeau (1987) stated that using computers in second-language classes has been beneficial from the point of view of students' motivation to learn the language. He also pointed out that using computers has improved the student-teacher relationship.

Chapelle and Jamieson (1986) investigated the effectiveness of CALL and examined two variables—time spent using CALL and attitude toward the CALL lessons. The findings indicated that those students who worked hard at learning a second language tended to spend time using CALL and had more positive attitudes toward it. Those students who were more analytic and able to detect patterns and subpatterns tended not to like to work on CALL, as compared to those who were easily lost in the totality of the stimuli.

Jordan (1992) recommended that teachers become directly involved in CALL activities rather than expecting the computer to do all the work. He said that the environment in which the computer is used is a major consideration. If the learning activity needs discussion and ideas, it is helpful to arrange groups of two or three students working on the computer.

There is general agreement on some of the advantages of CALL. One advantage is the opportunity it gives for individualized practice (Fox, 1982; Hooper & Hannafin, 1989). Another is the availability of immediate feedback, which is useful for training students to write accurately. CALL also stores students' response histories, which allows the computer to decide which exercise they should do next. This also helps teachers monitor in detail the progress of individual students,

identify problem areas, modify programs, and adjust their teaching (Fox, 1982).

Last (1984) summarized the merits and demerits of CALL as follows:

1. CALL is sensitive to the needs of the individual learner. . . . CALL can also increase the degree of interaction between learner and teacher (p. 100).
2. The response from CALL is instant; . . . The learner gains from an immediate response together with reinforcing commentary (p. 101).
3. CALL is not only interactive in the sense of dialogue between computer and learner, but also in that it is possible actually to increase the dialogue between learner and teacher (p. 101).
4. CALL encourages open knowledge, not just of the computer, but of the subject being learned (p. 101).
5. One of the great advantages of the micro, which is not directly linked to language teaching, is the fact that is not like a language laboratory or a tape slide synchronizer or any of the other hardware of educational technology: its applications do not cease within the narrow context of CALL work (p. 102).

According to Last, the problem in using CALL is that "it is difficult to apply CALL to deductive reasoning, to deducing rules from examples" (p. 102).

Hor (1991) contended that using computer-based instruction to teach Chinese promotes students' interest in learning Chinese characters. Displaying Chinese characters in computer graphics is helpful in teaching students to write those characters. Because of the nature of Chinese characters, visual aids that are available on the computer programs are important to learners (Hor, 1991). Language learning using computers with voice interface is "extremely dynamic, permitting students to quickly identify and improve weak areas" (Kincaid, Mullally & Kincaid, 1992, p. 30).

Researchers cannot consider computers as an independent variable and test their effects on language learning because the computer's

potential in this area is still undefined. Teachers cannot treat the computer as a substitute vehicle for existing instructional techniques and methodologies (Last, 1984; Weible, 1984). Rather they need to integrate what the computer offers into their curriculum in order to make the computer helpful in foreign language learning. CALL offers the following advantages: (a) computers structure the student's interaction with the subject matter and present learning strategies; (b) computers are process oriented, a quality that could be very helpful in teaching various features of the target language; and (c) if teachers properly devise computer applications for the curriculum, computers are able to meet individual learners' needs and/or abilities (Weible, 1984).

Barrutia (1970) reported that CALL is "(a) economically feasible, (b) educationally effective, and (c) enthusiastically received by most students at all levels of age and experience" (p. 369). The application of computerized education is beneficial to both students and teachers. Barrutia cited two benefits of computerized foreign language instruction: "(a) As the main role in learning is played by students, each student could proceed at a pace determined by his/her own capacity and motivation. (b) Tutorial and remedial assistance could be provided for all students during regularly scheduled courses" (p. 369–370).

In his research, Estarellas (1970) developed computerized self-instructional foreign language programs. The results of his study indicated that students with high language aptitudes did not need to spend too much time on the program and were able to finish it quickly. Those with lower aptitudes could spend more time studying the language with the self-instructional program. In either case, students were better able to schedule their studying and classes. However, the

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problem of motivation remained. "A student who does not want to learn will not be made to learn by programmed instruction" (p. 384), Estarellas asserted. Although computerized self-instructional programs are not a panacea, they do offer the advantages of student involvement and participation in the method. They also provide a sense of accomplishment at every step.

Kow (1984) developed an individualized instructional computer program to teach elementary Chinese language courses at a college. The results indicated that students who used the program had higher achievement test scores. The classes in which the program was used had fewer dropouts than those in which a conventional method of instruction was used.

Blomeyer (1985) conducted a detailed analysis of factors affecting microcomputer use in foreign language teaching. One of his findings was that "teachers observed during this research demonstrated the value of creating their own computerized lessons or adapting existing flexible materials to fit their curriculum design" (p. 345).

Silva (1991) gave two examples of common uses of computer spreadsheets and database programs in language learning. Computer software packages are commercially available, powerful, and useful pedagogically. However, teachers must devise specific applications and strategies so that the software packages can meet students' academic needs. The principles for devising specific applications for commercial programs are: (a) create opportunities to practice the target behavior, (b) allow for the desired learning sequence, (c) clearly set the criteria for success or failure, and (d) integrate instructional procedures into the learning sequence and the target behavior.

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As a result of his study on the use of computers in teaching writing compositions, Phinney (1990) concluded that:

> It is important to give students time to become familiar with the computer and software they are using so they can concentrate on their writing rather than on the technology. . . . . Nevertheless, this study indicates that positive change can and will occur over the course of a semester of computer-assisted composing (p. 201).

Neu and Scarcella (1990) found that students indicated a clear preference for using word processing in their second-language writing class. However the author said they could not envision a day when second-language classrooms would contain only computers and students. A trained second-language writing teacher is irreplaceable in the writing classroom, regardless of the tools being used. Teachers are responsible for ensuring that software, hardware, and room arrangements satisfy the requirements of a second language writing class.

Summary

Although the computer is not a panacea, it involves students in learning a second language through interaction. Careful teachers can use computers in second-language instruction because computer-assisted language learning is economically feasible, educationally effective, and enthusiastically received by most students.

One of the advantages of using computers as a tool in second-language learning is their ability to produce graphics and sound which increase learning. Students working on computers in dyads have better second-language learning effects than those working alone.

Teachers can adapt existing commercial programs to their plans for teaching second languages. Teachers involved in producing materials for CALL should understand the capacities and limitations of computers in

general. "Modern language teaching more than any other discipline depends not on technology or methodology, but on the qualities and personality of the individual teacher" (Last, 1984, p. 103).

Chapter Summary

Learners' intrinsic interest in a language is likely to be intensified by teaching about the language in addition to its structure. Computers can serve as a means of bringing students together to interact, to negotiate meaning, and to think, yet the teacher still plays an essential role in language learning (Steinberg, 1984). It is important for teachers to interact with the elements of a learning system and to take an active role in determining how computers and technology are used to promote intrinsic motivation in second-language learning. Teachers need to take an active stand regarding what students will do with computers.

In previous studies, there has been a strong indication that students become more motivated to learn if the course materials are available on computers. The computer, when used as a learning tool, often acts as a strong motivator for students. When computers are adapted as a learning tool in Chinese schools, teachers must be sensitive to the factors that affect American-born Chinese children's interest in learning the Chinese language. In Ryser's (1990) study,

> "Significant differences were found in attitude toward school and learning [between students who received computer instruction and those who did not]. According to the results of the attitude measure, students in the school that received computer instruction agreed more strongly with statements that pertained to students' perceptions of enthusiasm toward what they were learning and feelings of success in school than did students in the school that did not receive computer instruction" (p. 103).

Computers help to produce positive learning effects when they are used as a tool in second-language learning. Teachers adapting computers as a learning tool into their language teaching plans need to be careful in selecting software. Students should be arranged in dyads when working on the computers, for better learning effects.

> "It is not the computer itself that affects interaction. Rather, factors that affect interaction are the nature of the tasks teachers devise and the way that teachers organize classroom interactions centered around computer work or mediated through the computer. Rich language use will not necessarily result simply from introducing computers into a classroom" (Johnson, 1991, p. 77).

CHAPTER III

METHODOLOGY

Research Design

This study was designed to obtain information that can be useful to address problems in teaching Chinese as a second language to American-born Chinese children. The researcher's overall purpose in this study was to investigate the effects of using computers as a learning tool to promote American-born Chinese children's interest in learning Chinese language in the Chinese school. The instruments that were used were a background questionnaire, a learning interest scale, a pretest, and a posttest.

Research Questions

Question 1: Does using computers as a tool to learn Chinese promote interest in learning among American-born Chinese children across grade levels?

The independent variables in this question were "using computers as a tool to learn Chinese" and "grade levels." The dependent variables were "interest in learning Chinese," "the average of pretest and posttest results," and "the difference between pretest and posttest results." The information for answering this question was obtained from the learning interest scale (Appendix E), the background questionnaire (Appendix A), the pretest (Appendix C), and the posttest (Appendix D).

Question 2: Do American-born Chinese children learn more by using computers as a tool to learn Chinese, as compared to those not using computers?

The independent variable in this question was "using computers as a tool to learn Chinese," and the dependent variable was "the difference between pretest and posttest results." This question was answered with information gathered from the pretest and posttest (Appendices C and D).

Question 3: Does speaking Chinese at home affect students' learning in the Chinese school?

The independent variable in this question was "language spoken with parents at home"; the dependent variable were "the average of pretest and posttest results" and "the difference between pretest and posttest results." The researcher assumed that students who spoke Chinese to their parents at home would have higher achievement test scores than those who did not. It was further assumed that parents concerned about establishing a bilingual environment for their children would insist on the youngsters' speaking Chinese at home.

This question was answered with the information gathered from the background questionnaire and the pretest and posttest. The average and pretest-posttest difference scores were calculated and entered into a multiple regression and ANOVA models for analysis.

Question 4: Does parent's concern influence American-born Chinese children's learning in the Chinese school?

The independent variables in this question was "parent's concern". The dependent variable were "the average of pretest and posttest results" and "the difference between pretest and posttest results." This question was answered with information gathered from the background questionnaire and the pretest and posttest. The average and

pretest–posttest difference scores were calculated and entered into a multiple regression and ANOVA models for analysis.

Population and Sample

The population under investigation comprised American–born Chinese children who were enrolled in Chinese schools in the United States. A sample chosen for the study was divided into an experimental group and a comparison group. The experimental group was decided by the researcher based on the accessibility of time and financial constraints.

A list of Chinese schools which were located in a university city was provided by the Chinese Culture Institute of Taiwan in Chicago. Each Chinese school name in the list was written on a small piece of paper and placed in a box. The researcher randomly drew two names out of the box to obtain the comparison group. The Ann Arbor Chinese School and Kansas Chinese School were drawn the first time. Students in the Ann Arbor Chinese School were not selected as part of the comparison group because they were taught a simplified form of Chinese characters in that school. The Lansing Chinese School and the Kansas Chinese School taught the traditional form of characters.

The sample included 49 students enrolled in the Lansing Chinese school and the Kansas City Chinese school. The experimental group consisted of 25 students: eight American–born Chinese students enrolled in the first–level class (including kindergartners and first graders) of Lansing Chinese School, eight American–born Chinese students enrolled in the second–level class (including second and third graders) of the Lansing Chinese School, and nine American–born Chinese children enrolled

in the third-level class (including fourth and fifth graders) of the Lansing Chinese School.

The comparison group consisted of 24 students: eight American-born Chinese students enrolled in the first-level class of the Lansing Chinese School, eight students enrolled in each of the second-level and the third-level classes of the Kansas Chinese School in Kansas City, Kansas.

Discrepancies between the Lansing Chinese School and the Kansas City Chinese School

It is necessary to compare the differences between the Lansing Chinese School and the Kansas City Chinese School, because the different climates in the two schools may have influence on the research outcomes. Most parents in the Lansing Chinese School are either students and professors at Michigan State University or employees in different divisions of the state government. Although local employees stay in the area indefinitely, student households frequently move out the area upon their graduation, mostly in two-year intervals.

Most parents send their children to the Lansing Chinese School with the hope that it may spark a future interest in learning to speak Chinese and better relate to their Chinese heritage. Parents sometimes have the attitude that Chinese school grades are not important. Bribes are occasionally used in exchange for a Sunday afternoon at Chinese school.

Most teachers in the Lansing Chinese School are students at Michigan State University. These teachers are either single or married without children. They might have teaching experiences in Taiwan before they came to the United States to study. They do not have much

experience teaching American-born Chinese children. They often move out the area upon finishing their degrees, mostly in two-year intervals. Teachers may take the teaching job with a passenger or a visitor's attitude and may conceive the teaching responsibilities as earning a little cash for weekly groceries. The consequence is that the Lansing Chinese School has been recruiting inexperienced teachers every year.

Parents in the Kansas City Chinese School are working either for the medical center at the University of Kansas or in local industries and businesses. This results in a less mobile community than in Lansing, Michigan. Parents in Kansas City may hold a different attitude toward their children's attendance at the Chinese school. They may be more serious about their children's learning in the Chinese school than their counterparts in Lansing, Michigan.

Teachers in the Kansas City Chinese School are often parents of the students or permanent residents in the area. Some of them have been teaching for a long time, and have experience in teaching the Chinese language to American-born Chinese children. Their attitude toward educational responsibilities perhaps significantly different from a visitor's or a passenger's perspective.

The discrepancies between the Lansing Chinese School and the Kansas City Chinese School may have an impact on the students' attitude toward learning the Chinese language. This, in turn, may influence the students' learning and performance in the Chinese schools and the research results.

Treatment

Chosen Phonetics and Phrases

After discussions with the classroom teachers the researcher selected 30 phrases or characters (Appendix B) that were suitable for each class level and sent the list to the teachers before the semester began. The researcher chose the 30 characters or phrases for each class level from the standard textbooks distributed by the Chinese Culture Institute of Taiwan in Chicago. These textbooks were written by educators and printed in Taiwan. All the Chinese schools in the United States use the same textbook for each class level. There are 37 phonetics in the Chinese pronunciation system. The 37 phonetics and the 30 characters chosen by the researcher were for the first-level class.

The chosen phonetics, characters, and phrases were taught to the students during the 10-week semester. For both the experimental and the comparison groups, in-class practice and homework included the chosen phonetics, characters, and phrases in the areas of character recognition, translation, sentence making, and writing. The chosen phonetics, characters, and phrases were included in the posttest items.

Computers

Four computers (Macintosh SE) were set up in the classroom and were used to help the students of the experimental group learning the Chinese language. The Chinese system was installed on the four computers so that Chinese characters, instead of English letters, were seen on the screen when the computers were turned on. The computer sections for the experimental group were led by the researcher and the classroom teachers. These sections lasted an hour each week for each class level for 10 weeks. A mobile computer lab was set up and was

overseen by the researcher in a community room in Spartan Village, East Lansing.

Lesson Plan for the Experimental Group

The lesson plan for the experimental group was as follows: First week: introduction to Chinese computer system and typing on the Chinese keyboard. Second and third weeks: using characters or phrases to make sentences in Microsoft Word (a word processing program). Fourth week: Chinese composition in Microsoft Word. Fifth and sixth weeks: Drawing pictures and writing a story according to directions given in Super Paint (a graphics program). Seventh and eighth weeks: Chinese math in Excel (a spreadsheet program). Tenth week: review. Eleventh week: tests.

An instruction sheet (Appendix G) was handed out to students in the experimental group for every task. The instruction sheet was printed in Chinese. Students read and followed the instructions to start up the Chinese computer system, the word-processing program, the data base management program, the graphics program, and the spreadsheet program on the four computers. All of the computer programs were operated under the Chinese computer system.

Classroom Procedures

On the first day of class, teachers greeted the subjects as usual. Students in the experimental group were told that there would be an one-hour computer section in the last hour of each Chinese school day. The subjects were given a pretest at the beginning of the semester.

The chosen phonetics, characters, and phrases were covered in 10 weeks. The two Chinese schools—Lansing Chinese School and Kansas City

Chinese School—used the same standard textbooks distributed by the Chinese Culture Institute of Taiwan in Chicago. For the purpose of this study, the in-class practice and the amount of homework for both the experimental and comparison groups were arranged to be the same. The students in both groups worked in dyads when they did in-class practice. This was done to maintain the consistency of instruction across geographically separated classes.

In previous research (Dalton, Hannafin, & Hooper, 1989; Hooper & Hannafin, 1989; Johnson, 1991) it was found that students working in dyads learned better. This was the reason to have students practice in-class assignments in dyads.

A typical day in a classroom in a Chinese school during the research is described as follows. The teacher greeted the students and asked them to open their textbooks to a certain lesson. The teacher read the entire lesson, which took about five minutes. The teacher wrote down the vocabulary words for the lesson on the chalkboard, explained the words and gave examples of when and how to use them. The teacher then asked students to read the first paragraph of the lesson. The teacher explained the meaning of the sentences and made sure the students understood the meaning of the paragraph. The teacher then asked students to read the succeeding paragraph and explain them until the end of the lesson. The teacher then asked the class to read the whole lesson aloud.

Then came the practice time. Students used the newly learned vocabulary words to do exercises in translation, filling in the blank, and sentence making, which were at the end of each lesson in the

textbook. It took about two hours to teach the lesson and do the exercises. Students took a 10-minute break every hour.

During the last hour, students read Chinese story books or newspapers published for elementary school students. Sometimes the teacher had students do activities related to the Chinese culture, such as Chinese calligraphy, Chinese chess, and so on. The textbooks and the newspapers were provided free by the Chinese Culture Institute of Taiwan in Chicago.

The computer section was implemented in each class level of the experimental group in the Lansing Chinese School. Students in the experimental group used four Macintosh SE computers to practice or review the phrases taught the same week. The practice or review was carried out using different computer applications such as Excel, Super Paint, and Microsoft Word for an hour. The teacher of each class level and the researcher guided the experimental group in each classroom together.

The subjects were asked to do in-class practice. The practice included the chosen characters and phrases and focused on those taught in the week's class. The amount of practice and homework for both the experimental and the comparison groups was the same. Homework was given to the subjects before the class was dismissed.

A posttest was given to the subjects during the 11th week of the semester. The classroom teachers graded the pretests and posttests and sent the test scores to the researcher for analysis.

Instrumentation and Data Collection

Student Background Information Questionnaire

The researcher designed the Student Background Information questionnaire (Appendix A) for use in this study. In this questionnaire, the subjects were asked to supply information about their personal characteristics, languages spoken at home, and interest in learning Chinese. Classroom teachers distributed the questionnaires and students completed them at the beginning of the semester. The classroom teachers collected completed questionnaire and sent them back to the researcher.

The background information gathered through this questionnaire included gender, class level, time spent on studying Chinese, ways of doing Chinese homework, and language spoken at home. All of these items were coded and entered into the computer. *Gender* was coded as 0 for female and 1 for male. *Class Level* was coded as 1, 2, and 3. *Time Spent on Studying Chinese everyday* was coded as 0 for less than 20 minutes and 1 for more than 20 minutes. *Ways of Doing Chinese Homework* was coded as 0 for finishing in one morning or afternoon and 1 for doing a portion of homework everyday. *Language Spoken with Parents at Home* was coded as 0 for Speaking English at Home and 1 for Speaking Chinese at Home.

Information on group, language spoken with parents at home, time spent on studying Chinese everyday, and ways of doing Chinese homework were used as independent variables and were plugged into the model for multiple regression analysis to determine whether any success with computer-assisted Chinese language learning was influenced by the variables of age and language spoken at home.

Validity and reliability were tested in three ways. First, students' responses to the questionnaire were collected in a pilot study conducted by the researcher in Spring 1993. Second, the principals of the two Chinese schools were invited to comment on the questionnaire items. Third, the classroom teachers' opinions about the background questionnaire items were solicited. These responses, comments, and opinions were used to modify the items on the background questionnaire.

The Pretest

At the beginning of the semester, the classroom teachers administered a pretest (Appendix C) designed by the researcher to the subjects. The pretest for the first-level class was divided into three parts: Chinese phonetics, character recognition, and translation. The pretests for the second- and the third-level classes also were divided into three parts: translation, filling in the blank, and sentence making. There were 10 items on each part of the test except for Chinese phonetics, there were 24 items in that portion of the pretest.

All three parts of the pretest for students in the first-level class were done orally. The translation part of the pretest for the second-level students was an oral test. All three parts of the third-level students' pretest were written.

Each correct item in each part of the pretest was counted as one point. The sum of the points in each part constructed the pretest score. If a first-level student obtained 20 to 24 points in phonetics this meant that the student recognized the phonetics well and understood the basics of Chinese pronunciation. If a first-level student scored 10 points in Chinese character recognition this indicated that he or she recognized those characters. Similarly, if a first-level student had 10

points in translation this indicated that he or she knew the meanings of those characters. If a second- or third-level student scored 10 points on the translation part, that meant he or she knew the meanings of those phrases. If a second- or third-level student had 10 points on fill-in-the-blank that meant he or she understood when to use those phrases. Likewise, if a second- or third-level student scored 10 points on the sentence-making part, that meant he or she knew how to use those phrases.

The Posttest

A posttest (Appendix D) was given to the subjects during the 11th week of the semester. The posttest included the 30 characters and phrases chosen by the researcher. The degree of difficulty of the posttest was the same as that of the pretest. The posttest for the first-level class was divided into three parts: Chinese phonetics, character recognition, and translation. The posttests for the second- and third-level classes were also divided into three parts: translation, fill-in-the-blank, and sentence-making.

Like the pretest, the posttest for the first-level students was an oral test. The translation part of the posttest for the second-level students was an oral test. All three parts for the third-level students were written.

As in the pretest, each correct item in the posttest was counted as one point. The sum of the points in each part of the test constructed the posttest score. Teachers sent both the pretest and posttest scores to the researcher, who entered the scores into the computer. To determine whether a student had improved his or her learning during the 10-week period, the average and the difference

between pretest and posttest scores were computed. Although the Chinese language test was included in the Standard Aptitude Test in 1994 by Educational Testing Service, there was still no test statistic which can be used as a basis to test reliability for the test items in the pretest and posttest of this research.

Learning Interest Scale

The researcher developed two Learning Interest Scales (Appendix E), one for students and the other for parents based on Ryser's (1990) Attitude Toward School and Learning Scale (ATSALS), in order to measure any changes in the subjects' interest in learning. Students and parents were asked to complete the scale at the beginning of the semester. They responded to each item using a 5-point Likert-type scale, ranging from strongly Agree (1) to Strongly Disagree (5). The classroom teachers collected the completed scales and sent back to the researcher. The researcher entered the responses into the computer.

During the 11th week of the semester, parents and students again completed the Learning Interest Scale. Responses again were coded and entered into the computer. Information gathered from the scales completed at the beginning of the semester was compared to that gathered at the end of the semester, to determine whether there had been a change in students' interest in learning.

In the Learning Interest Scales the first and second items for students and parents, "I am bored with learning Chinese" and "I like to write in Chinese," were used to find out if there was interest change in learning the Chinese language. The fourth, fifth, and seventh items for students and parents, "Learning Chinese is boring when using the computer," "I would like to continue learning Chinese through the use of

a computer," and "I like to write in Chinese on the computer," were used to see if using computers promoted interest in learning the Chinese language. The ninth and tenth items for students and the sixth and ninth items for parents, "My parents help me a lot in doing Chinese homework" and "My parents are concerned with my performance in Chinese School," were used to determine parents' concern about their children's learning the Chinese language.

The reliability of the learning interest scales was tested in two ways. First, classroom teachers were invited to share their opinions on the survey items. Second, the guidance committee members for this research project were invited to comment on the instrument. The scales were modified, based on these opinions and comments.

The validity of the Learning Interest Scales was tested in two ways. First, students' and parents' responses to the scales were collected in a pilot study conducted by the researcher in Spring 1993. Second, the principals of the two Chinese schools were invited to comment on the scale items. These responses and comments were used to modify the scale items.

Data Analysis

Descriptive statistics, *t*-test, two-way analysis of variance (ANOVA), and multiple regression were employed to analyze the data. Descriptive statistics served the preliminary purpose of describing the variance in and performance of both the experimental and comparison groups. *t*-test was used to compare the pretest and posttest scores of both the experimental and comparison groups. Two-way ANOVA was used to detect interaction effects among variables. Multiple regression was

used to examine the relationships between the independent and dependent variables.

The dependent variables were learning interest, the average of pretest and posttest, and the difference between pretest and posttest scores. The independent variables were the treatment (using computers as a learning tool), language spoken with parents at home, time spent on studying Chinese every day, and ways of doing Chinese homework.

t-test, two-way ANOVA, and multiple regression were employed to analyze the data drawn from non-randomly samples in this research. It would be inappropriate to infer the research results to general foreign language learning.

Statistical analyses were conducted using the *Statistical Package for the Social Sciences* for personal computers (SPSS/PC+). Results of the data analyses are reported in Chapter IV.

CHAPTER IV

RESULTS

This study was undertaken to investigate the effects of using computers as a learning tool in promoting American-born Chinese children's interest in learning Chinese as a second language. A background questionnaire, an interest scale, a pretest, and a posttest were used to collect the data. This chapter contains the results of the data analyses. The results are presented in three sections: (a) the effect of using computers as a learning tool to promote interest in learning interest, (b) whether American-born Chinese children learn more by using computers as a tool for learning Chinese, and (c) the influence of speaking Chinese at home and parental concern on American-born Chinese children's learning Chinese.

The Effect of Using Computers as a Learning Tool to Promote Interest Across Grade Levels

Findings

The pretest and posttest scores, average pretest-posttest scores and the difference between the pretest and posttest scores for the comparison and experimental groups are shown in Table 2. The mean of pretest-posttest difference scores for the comparison group was 9.21

points (Table 2, Difference Mean), whereas the experimental group had 5.96 points (Table 2, Column of Difference Mean).

Table 2: Descriptive Statistics:
Average and Pretest-Posttest Difference Scores
by Group

		PRETEST		POSTTEST		AVERAGE		DIFFERENCE	
G	N	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
0	24	30.83	12.87	40.04	15.03	35.44	13.42	9.21	7.92
1	25	35.16	14.20	41.12	13.93	38.14	13.90	5.96	4.33

G: Groups 0 - Comparison Group
1 - Experimental Group
N: Number of Subjects

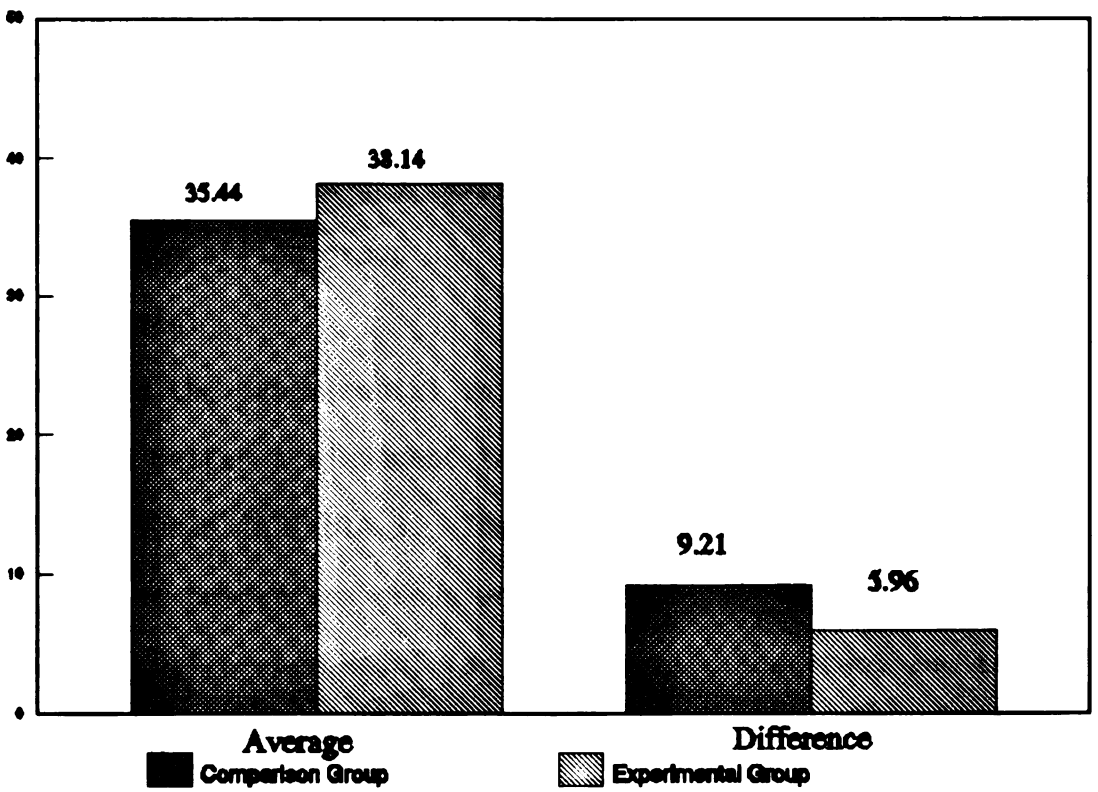

Figure 2: Average and Pretest-Posttest Difference Scores by Group

This means that students in the comparison group improved more in the posttest than those in the experimental group. Moreover, the experimental group had higher average scores (38.14 points, Table 2, Column of Average Mean) than the comparison group (35.44 points, Table 2, Column of Average Mean). This indicates that the experimental group scored better in the achievement tests than the comparison group.

The comparison group had higher standard deviation for difference pretest-posttest scores (7.92 points, Table 2, Column of Difference SD) than the experimental group had (4.33 points, Table 2, Column of Difference SD). In other words, more students in the comparison group were on both extremes, either improved themselves significantly or made little progress in the achievement tests, than those were in the experimental group.

In Figure 2, the bar chart depicts the data shown in Table 2. The experimental group had higher average mean and lower difference mean, whereas the comparison group had lower average mean and higher difference mean.

In both the experimental and the comparison group, higher-level students had better achievement test results than did lower level students as shown in Table 3. The mean pretest-posttest difference scores for the comparison group were 2.63, 11.38, and 13.63 (see Table 3, Column of Difference Mean) for grade levels one, two, and three, respectively. The mean pretest-posttest difference scores for the experimental group were 4.00, 6.38, and 7.33 (Table 3, Column of Difference Mean) for grade levels one, two, and three, respectively.

Table 3: Descriptive Statistics:
Pretest-Posttest Difference Scores
by Group and Grade Level

			PRETEST		POSTTEST		DIFFERENCE	
G	L	N	MEAN	SD	MEAN	SD	MEAN	SD
0	1	8	18.38	5.04	21.00	5.63	2.63	2.26
0	2	8	39.50	8.75	50.88	5.64	11.38	6.23
0	3	8	34.63	12.76	48.25	7.32	13.63	9.21
1	1	8	19.13	5.46	23.13	3.80	4.00	2.83
1	2	8	41.75	9.57	48.13	5.91	6.38	5.83
1	3	9	43.56	10.91	50.89	7.66	7.33	3.64

G: Groups 0 - Comparison Group
1 - Experimental Group
L: Levels 1 - Level 1
2 - Level 2
3 - Level 3
N: Number of Subjects

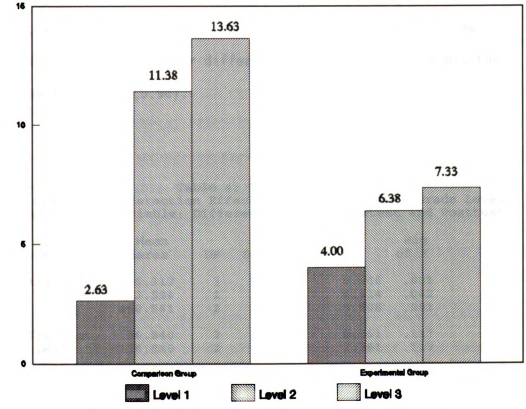

Figure 3: Pretest-Posttest Difference Scores by Group and Grade Level

In Figure 3, the bar chart shows the pretest-posttest difference scores for the three level students in both the comparison and experimental groups. Higher level students had higher difference scores than did lower level students.

A two-way ANOVA was employed to examine the interaction effects between sample groups across the grade levels. The results are shown in Table 4. In the far right column, .117 indicates that at the 95% confidence level, no interaction effect was found between group and grade level. In the same column, .042 indicates that the pretest-posttest difference between the experimental and comparison groups was slightly significant. This means that one group performed better than the other. In order to determine which group performed better, refer to the column of Difference Mean in Table 2. The comparison group had higher difference scores (9.21) than did the experimental group (5.96).

Table 4: Two-Way ANOVA:
Examining Interaction Effects between Group and Grade Level
Dependent Variable: Difference between Pretest and Posttest

Source of Variation	Mean Squares	DF	Sum of Squares	F	Sig of F
Main Effects	585.312	3	195.104	6.446	.001
Group	133.594	1	133.594	4.414	.042
Level	460.561	2	230.281	7.608	.001
2-Way Interact.	136.840	2	68.420	2.261	.117
Group Level	136.840	2	68.420	2.261	.117
Explained	718.622	5	143.724	4.748	.002
Residual	1301.500	43	30.267		
Total	2020.122	48	42.086		

In Table 4, in the column of the far right (Sig of F), .001 indicates that significant results also were found across the grade levels. This confirms the data shown in Table 3 that the third-level students in the experimental group performed better than the second-level and the first-level students in that group. This can be seen in Table 3, in the column of Difference Mean: 4.00, 6.38, and 7.33 for grade levels one, two, and three, respectively. The comparison group had the same test result as did the experimental group: 2.63, 11.38, and 13.63 for grade levels one, two, and three, respectively.

Crosstab tables with a chi-square test were used to determine whether students' interest in learning Chinese changed over the research period. Three questions on the Learning Interest Scale were used in assessing change in learning interest: "I am bored with learning Chinese," "I like to write in Chinese with computers," and "I like to continue learning Chinese with computers." The responses were coded as 0: Disagree and 1: Agree. Each question had pre- and post-responses. The result of subtracting the pre-response from the post-response was taken as a new variable for each question. Each new variable had three possible values: 0 = Unchanged, 1 = Increased, and -1 = Decreased. Crosstab tables with a chi-square test were used to determine the interest change on the three questions.

A significant change was found in the crosstab table with chi-square test for the item: "I am bored with learning Chinese" (see Table 5, Pearson significance: .00015). More students in the experimental group than in the comparison group changed their interest in learning Chinese over the research period. As shown in Table 5, 17 students in both the experimental and the comparison group who had been bored with learning

Chinese at the beginning of the semester had changed their attitude by the end.

Table 5: Crosstab with Chi-Square Test
for Learning Interest Change on the Statement:
"I am bored with learning Chinese"

GROUP	Count / Exp Val / Residual	Decreased -1	Unchanged 0	Row Total
Comparison	-1	2 8.3 -6.3	22 15.7 6.3	24 49.0%
Experimental	1	15 8.7 6.3	10 16.3 -6.3	25 51.0%
	Column Total	17 34.7%	32 65.3%	49 100.0%

Chi-Square	Value	DF	Significance
Pearson	14.42678	1	.00015

The difference between the pre-response and the post-response on the statement "I am bored with learning Chinese" for the experimental group is shown in Table 6. The same information is given for the comparison group in Table 7. Three students in the experimental group did not feel bored with learning Chinese at the beginning and 15 students did not feel bored at the end of the research period (Table 6). In contrast, 20 students in the comparison group were interested in learning Chinese at the beginning of the research period and 22 students were interested in learning Chinese at the end.

Table 6: Pre- and Post-responses of the Experimental Group to the Statement: "I am bored with learning Chinese"

Pretest:

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Disagree	0	3	12.0	12.0	12.0
Agree	1	22	88.0	88.0	100.0
	Total	25	100.0	100.0	

Posttest:

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Disagree	0	18	72.0	72.0	72.0
Agree	1	7	28.0	28.0	100.0
	Total	25	100.0	100.0	

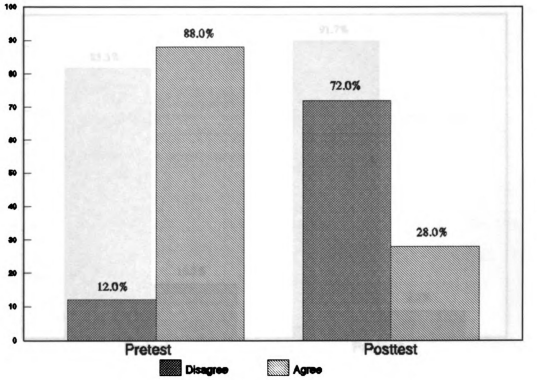

Figure 4: Pre- and Post-responses of the Experimental Group to the Statement "I am bored with learning Chinese"

Table 7: Pre- and Post-responses of the Comparison Group to the Statement: "I am bored with learning Chinese"

Pretest:

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Disagree	0	20	83.3	83.3	83.3
Agree	1	4	16.7	16.7	100.0
	Total	24	100.0	100.0	

Posttest:

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Disagree	0	22	91.7	91.7	91.7
Agree	1	2	8.3	8.3	100.0
	Total	24	100.0	100.0	

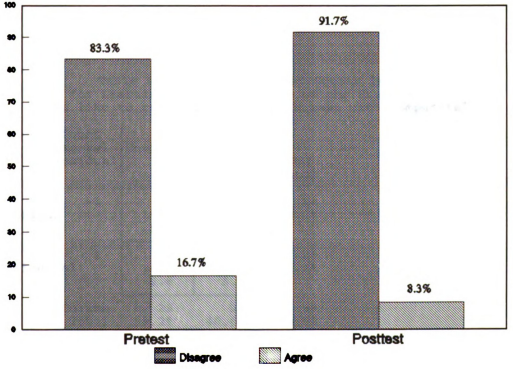

Figure 5: Pre- and Post-responses of the Comparison Group to the Statement "I am bored with learning Chinese"

Did students' interest in continuing to learn Chinese increase because of the help they received from using computers? To answer this question, the increased interest of the experimental group was tested for significance (see Table 8). There was no data showing a significant difference in the interest change in the experimental group across grade levels (Table 9, Pearson significance: .48922). The researcher had expected that subjects in higher levels would have a higher rate of interest change after using computers as a tool to learn Chinese and that younger students would have a lower rate of interest change. In this study, however, it was found that interest in learning Chinese remained at the same level, no matter which grade the subjects were in and whether or not they used computers.

Table 8: Crosstab with Chi-Square Test
for Learning Interest Change on the Statement:
"I'd like to continue learning Chinese with computers"

GROUP	Count / Exp Val / Residual	Unchanged 0	Increased 1	Row Total
Comparison	-1	20 14.2 5.8	4 9.8 -5.8	24 49.0%
Experimental	1	9 14.8 -5.8	16 10.2 5.8	25 51.0%
	Column Total	29 59.2%	20 40.8%	49 100.0%

Chi-Square	Value	DF	Significance
Pearson	11.35674	1	.00075

Table 9: Crosstab with Chi-Square Test
for Learning Interest Change Across Grade Levels
for Experimental Group on the Statement:
"I'd like to continue learning Chinese with computers"

	Exp Val / Residual	Unchanged 0	Increased 1	Row Total
Level 1	1	4 2.9 1.1	4 5.1 -1.1	8 32.0%
Level 2	2	3 2.9 .1	5 5.1 -.1	8 32.0%
Level 3	3	2 3.2 -1.2	7 5.8 1.2	9 36.0%
	Column Total	9 36.0%	16 64.0%	25 100.0%

Chi-Square	Value	DF	Significance
Pearson	1.42988	2	.48922

After using the Chinese word-processing package on the computers, the data obtained failed to reveal whether or not the interest in writing in Chinese changed significantly for subjects in the experimental group (see Table 10, Pearson significance: .08884). Also for the experimental group, the data failed to reveal whether the change observed was significant across grade levels in students' interest in writing in Chinese with computers (Table 11, Pearson significance: .10976).

Table 10: Crosstab with Chi-Square Test
for Learning Interest Change on the Statement:
"I like to write in Chinese with computers"

GROUP	Exp Val / Residual	Decreased -1	Unchanged 0	Increased 1	Row Total
Comparison	-1	2 1.5 .5	19 16.2 2.8	3 6.4 -3.4	24 49.0%
Experimental	1	1 1.5 -.5	14 16.8 -2.8	10 6.6 3.4	25 51.0%
	Column Total	3 6.1%	33 67.3%	13 26.5%	49 100.0%

Chi-Square	Value	DF	Significance
Pearson	4.84175	2	.08884

Table 11: Crosstab
for Learning Interest Change for
the Experimental Group on the Statement:
"I like to write in Chinese with computers"

	Exp Val / Residual	Decreased -1	Unchanged 0	Increased 1	Row Total
Level 1	1	0 .3 -.3	7 4.5 2.5	1 3.2 -2.2	8 32.0%
Level 2	2	1 .3 .7	4 4.5 -.5	3 3.2 -.2	8 32.0%
Level 3	3	0 .4 -.4	3 5.0 -2.0	6 3.6 2.4	9 36.0%
	Column Total	1 4.0%	14 56.0%	10 40.0%	25 100.0%

Chi-Square	Value	DF	Significance
Pearson	7.54464	4	.10976

Conclusions

Subjects in the experimental and comparison groups did not differ significantly with regard to their pretest-posttest difference scores. Nevertheless, overall students in higher grade levels had higher pretest-posttest difference scores than did students in lower grade levels. For the students in the experimental group, interest in learning Chinese increased over the research period.

After using computers as a tool to learn Chinese, students in the experimental group indicated they would like to continue learning Chinese with computers. Yet there was no evidence that students in either group liked to continue in their appreciation of writing in Chinese with computers.

Do American-Born Chinese Children Learn More by Using Computers as a Tool Learning Chinese?

Findings

Using computers as a learning tool did not increase American-born Chinese children's learning Chinese in the Chinese school. No significant difference was found in the means of the pretest-posttest difference scores between the experimental group and the comparison group (see Table 12). Using computers as a learning tool did not help American-born Chinese children learn more in the Chinese school.

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Table 12: Results of *t*-test
Analyzing Means of Pretest-Posttest Difference Scores
for the Experimental and Comparison Groups

Variable	Number of Cases	Mean	SD	SE of Mean
DIFF				
Comparison	24	9.2083	7.918	1.616
Experimental	25	5.9600	4.325	.865

Mean Difference = 3.2483
Levene's Test for Equality of Variances: F= 9.752 P= .003

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	1.79	47	.080	1.813	(-.399, 6.896)
Unequal	1.77	35.29	.085	1.833	(-.474, 6.971)

Conclusion

The *t*-test results failed to reveal whether or not American-born Chinese children learned more by using computers as a tool for learning Chinese in the Chinese school.

The Influence of Speaking Chinese at Home and Other Factors on American-Born Children's Learning Chinese

Findings

Four variables—group, language spoken with parents at home, time spent on studying Chinese every day, and way of doing Chinese homework—were plugged into a multiple regression model to discover the influence that each variable had on the average of students' pretest and posttest scores (Table 13) and the pretest-posttest difference scores (Table 15).

In Table 13, two variables and an interaction in the multiple regression model were found to be significant at the .05 level for the

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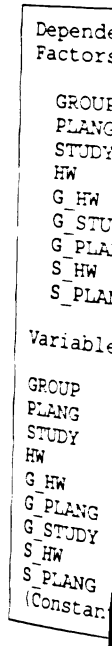

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average of the pretest and posttest scores. Subjects who spoke Chinese to their parents at home had higher average scores (by 4.7 points) than subjects who did not. Subjects who did a portion of their homework every day had higher average scores (by 11.9 points) than children who finished their homework in one day. The interaction between group and time spent on studying Chinese every day was significant.

Table 13: Multiple Regression on the Average of Pretest and Posttest Scores

Dependent Variable: AVG (Average of Pretest and Posttest)
Factors: GROUP PLANG STUDY HW S_HW G_STUDY G_HW G_PLANG S_PLANG

GROUP	Group
PLANG	Language Spoken with Parents
STUDY	Time Spent on Studying Chinese Every Day
HW	Way of Doing Chinese Homework
G_HW	Interaction between GROUP and HW
G_STUDY	Interaction between GROUP and STUDY
G_PLANG	Interaction between GROUP and PLANG
S_HW	Interaction between STUDY and HW
S_PLANG	Interaction between PLANG and STUDY

Variable	B	SE B	Beta	T	Sig T
GROUP	2.337103	2.250668	.173661	1.038	.3055
PLANG	4.777778	2.357575	.346029	2.027	.0496
STUDY	-7.249306	4.134931	-.512915	-1.753	.0874
HW	11.941964	3.413676	.864893	3.498	.0012
G_HW	9.742361	5.366397	.723918	1.815	.0772
G_PLANG	-.100694	2.022293	-.007470	-.050	.9605
G_STUDY	-10.278770	4.695014	-.750939	-2.189	.0346
S_HW	-6.184325	4.470712	-.301336	-1.383	.1744
S_PLANG	4.656250	2.472007	.342511	1.884	.0671
(Constant)	41.857639	3.585142		11.675	.0000

The interaction between group and time spent on studying Chinese every day had a negative B value. Which group of students had higher average scores? As shown in Table 14, students in the comparison group who said they spent 20 or more minutes studying Chinese every day had

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G	S	N
-1	-1	18
-1	1	6
1	-1	14
1	1	11

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average scores that were 10.3 points (see Table 13) higher than those of students who said they spent less time studying.

Table 14
Average and Pretest-Posttest Difference Scores by Group and Time Spent on Studying Chinese

			PRETEST		POSTTEST		AVERAGE		DIFFERENCE	
G	S	N	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
-1	-1	18	27.72	12.47	35.94	15.11	31.83	13.35	8.22	7.38
-1	1	6	40.17	9.68	52.33	4.68	46.25	5.96	12.17	9.43
1	-1	14	30.00	9.77	37.71	11.52	33.86	10.42	7.71	4.71
1	1	11	41.73	16.60	45.45	16.01	43.59	16.26	3.73	2.49

G: Groups -1 - Comparison Group
1 - Experimental Group
S: Time Spent on Studying Chinese Everyday
-1 - Spent Less Than 20 Minutes
1 - Spent 20 Minutes or More
N: Number of Subjects

Using the pretest-posttest difference scores, the variables of group and language spoken with parents at home in the multiple regression model were tested for significance (see Table 15). Both variables had negative B values. On average, students in the comparison group had higher pretest-posttest scores by 2.2 points.

According to Table 15, students who spoke English to their parents at home improved more than students who spoke Chinese at home. The difference in scores for the two groups between the pretest and the posttest was 2.6 points. The reason for this difference might be that students who spoke Chinese at home had been exposed to a bilingual environment and were used to the language and the context. Thus, they might have been more fluent in Chinese than students who spoke English

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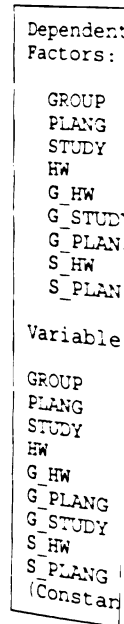

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at home. This could explain why students who spoke Chinese at home had higher average scores and lower pretest-posttest differences than their counterparts who spoke English at home.

Table 15: Multiple Regression
on Pretest-Posttest Difference Scores

Dependent Variable: DIFF (Difference of Pretest and Posttest)
Factors: GROUP PLANG STUDY HW S_HW G_STUDY G_HW G_PLANG S_PLANG

GROUP	Group
PLANG	Language Spoken with Parents
STUDY	Time Spent on Studying Chinese Every Day
HW	Way of Doing Chinese Homework
G_HW	Interaction between GROUP and HW
G_STUDY	Interaction between GROUP and STUDY
G_PLANG	Interaction between GROUP and PLANG
S_HW	Interaction between STUDY and HW
S_PLANG	Interaction between PLANG and STUDY

Variable	B	SE B	Beta	T	Sig T
GROUP	-2.204365	1.072305	-.343243	-2.056	.0465
PLANG	-2.634921	1.123239	-.399897	-2.346	.0242
STUDY	-.233135	1.970040	-.034566	-.118	.9064
HW	.330357	1.626407	.050138	.203	.8401
G_HW	1.487103	2.556758	.231558	.582	.5642
G_PLANG	.548611	.963498	.085282	.569	.5724
G_STUDY	-3.545635	2.236885	-.542814	-1.585	.1210
S_HW	-.531746	2.130019	-.054295	-.250	.8042
S_PLANG	1.372024	1.177759	.211492	1.165	.2511
(Constant)	8.983135	1.708100		5.259	.0000

Although most parents in this study might like to have a bilingual environment available to their children, it might be easier and more comfortable for American-born Chinese children to speak English at home. Parents would be very patient and persistent to have their children speak Chinese at home.

One possible reason Chinese children use English when talking to their parent is that parents may not insist that the children be

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bilingual. When the children begin to learn to talk, parents may be concerned about their children speaking English when they go out to play or go to school. In addition, perhaps when children start speaking English with their playmates, parents may let them, and then it may be difficult, if not impossible to insist that their children speak Chinese at home.

Did parent's concern affect the pretest-posttest difference scores? From the data in Table 16, one cannot tell whether or not parent's concern was a significant influence in this respect. Instead, language spoken with parents at home played a significant role in increasing the difference scores of the pretest and the posttest. The data in Table 17 failed to show whether or not language spoken with parents at home did not have a notable effect on increasing students' average scores (Table 17), whereas parent's concern appeared to have had a significant influence on average scores.

Table 16: 2-Way ANOVA
Examining Interaction Effects Between
Language Spoken at Home and Parental Concern
on Pretest-Posttest Difference Scores

Source of Variation	Mean Squares	DF	Sum of Square	F	Sig of F
Main Effects	512.410	2	256.205	7.653	.001
LANG	468.356	1	468.356	13.990	.001
CONCERN	31.880	1	31.880	.952	.334
2-Way Interactions	.493	1	.493	.015	.904
LANG CONCERN	.493	1	.493	.015	.904
Explained	513.574	3	171.191	5.113	.004
Residual	1506.549	45	33.479		
Total	2020.122	48	42.086		

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CONCER					
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0	0	8
0	1	11
1	0	11
1	1	19

L: Langua
0 - En
1 - Ch
C: Parent
0 - No
1 - St
N: Number

Table 17: 2-Way ANOVA
Examining Interaction Effects Between
Language Spoken at Home and Parental Concern
on Average Scores on the Pretest and Posttest

Source of Variation	Mean Squares	DF	Sum of Square	F	Sig of F
Main Effects	1322.255	2	661.128	4.656	.015
LANGUAGE	368.884	1	368.884	2.598	.114
CONCERN	1006.042	1	1006.042	7.084	.011
2-Way Interaction	534.261	1	534.261	3.762	.059
LANG CONCERN	534.261	1	534.261	3.762	.059
Explained	2480.523	3	826.841	5.823	.002
Residual	6390.324	45	142.007		
Total	8870.847	48	184.809		

As shown in Table 18, students who spoke English in homes without strong parental concern had the highest pretest-posttest difference scores, although they had the lowest average scores. This finding is congruent with the conjecture finding that speaking Chinese at home had an effect on increasing students' average scores but not their pretest-posttest difference scores.

Table 18: Descriptive Statistics:
Language Spoken at Home and Parental Concern
with Average and Pretest-Posttest Difference Scores

L	C	N	PRE	SD	POST	SD	AVG	SD	DIFF	SD
0	0	8	25.25	8.63	38.50	13.97	31.88	11.20	13.25	6.16
0	1	11	28.36	11.32	38.55	12.46	33.45	11.49	10.18	6.26
1	0	11	35.36	16.61	39.55	16.73	37.45	16.59	4.18	3.34
1	1	19	37.68	13.17	43.26	14.76	40.47	13.63	5.58	6.31

L: Language Spoken with parents at Home
0 - English
1 - Chinese
C: Parent's Concern
0 - Not Strong
1 - Strong
N: Number of Subjects

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In Figure 6 the bar chart renders the data shown in the columns of AVG and DIFF in Table 18. Speaking Chinese at home had an influence on increasing students' average scores but not their difference scores.

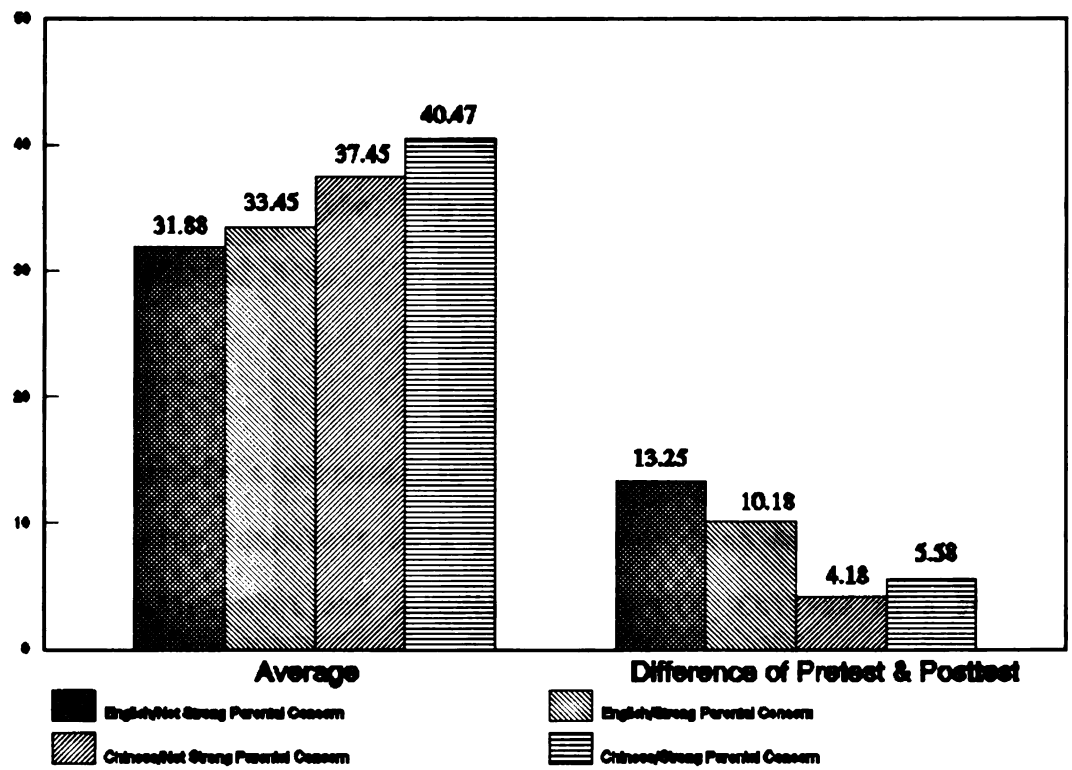

Figure 6: Language Spoken at Home and Parental Concern with Average and Pretest-Posttest Difference Scores

Conclusion

Four variables—group, language spoken with parents at home, time spent on studying Chinese every day, and way of doing Chinese homework—and the interactions among those variables were plugged into a

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multiple regression model to determine whether each element contributed to variations in the average pretest and posttest scores and the pretest–posttest difference scores.

It was found that speaking Chinese with parents at home and method of doing homework had an influence on increasing students' average scores. Students in the comparison group and those who studied Chinese more than 20 minutes every day had higher average scores than did other students. Nevertheless, students in the comparison group who spoke English with their parents at home had higher pretest–posttest difference scores than those in the experimental group who spoke Chinese to their parents at home.

Summary

The researcher's purposes in this research were (a) to examine the effects of using computers as a tool in promoting American–born Chinese children's achievement and interest in learning Chinese as a second language, and (b) to determine whether or not there are relationships between using computers as a tool in learning the Chinese language and the variables of age, language spoken with parents at home, and way of doing homework.

The research data showed that using computers as a learning tool did help to promote interest in learning the Chinese language among students in the experimental group over the research period. But there was no evidence that using computers as a learning tool helped to change these students' interest in writing in Chinese. Most students in both groups had the same feelings about writing in Chinese at the end of the research period as they had at the beginning. Also, students in the

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experimental group did not learn more in the Chinese school by using computers as a tool than did students in the comparison group.

Four variables—group, language spoken with parents at home, time spent on studying Chinese every day, and method of doing homework—and interactions among them were tested in a multiple regression model to discover the influence that each variable had on the average of students' pretest and posttest scores and the pretest–posttest difference scores. Subjects who spoke Chinese to their parents at home had higher average scores (by 4.7 points) than those who did not. Subjects who did a portion of their homework every day also had higher average scores (by 11.9 points). Subjects in the comparison group who said they spent 20 or more minutes every day studying Chinese had higher average scores than other students (by 10.3 points).

Students in the comparison group had higher pretest–posttest difference scores (by 2.2 points) than those in the experimental group. Subjects who spoke English at home had higher scores (by 2.6 points) than those who spoke Chinese at home. The reason for this difference may be that students who were encouraged to speak Chinese at home had been exposed to a bilingual environment and were more fluent in the language than those who spoke English to their parents at home.

Did parent's concern affect students' average scores and pretest–posttest difference scores? On one hand, parent's concern did not have a significant influence on increasing students' pretest–posttest difference scores. Instead, language spoken with parents at home played a significant role increasing students' pretest–posttest difference scores. On the other hand, language spoken with parents at home did not have a notable effect on increasing

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students' average scores, whereas parent's concern had a significant influence on increasing students' average scores.

Chapter V contains a discussion of the major findings, conclusions drawn from the findings, and deliberation and recommendations for future research.

CHAPTER V

DISCUSSIONS

This research was undertaken to answer the following questions:

1. Does using computers as a tool to learn Chinese promote interest in learning among American-born Chinese children across the grade levels?
2. Do American-born Chinese children learn more by using computers as a tool for learning Chinese, as compared to those not using computers?
3. Does speaking Chinese at home affect American-born Chinese children's learning in the Chinese school?
4. Does parent's concern influence American-born Chinese children's learning in the Chinese school?

The findings pertaining to these questions are discussed in the following section. Conclusions drawn from the findings are presented next, followed by recommendations for future research.

Statistical Findings

In this section, each hypothesis is restated, followed by the findings regarding that hypothesis.

Hypothesis 1a: There is no difference in promoting interest in learning the Chinese language between American-born Chinese children who use computers as a learning tool and those who do not use computers. A

two-way ANOVA and descriptive statistics were used to test the data for this hypothesis. Interest in learning Chinese in the Chinese school increased significantly for subjects in the experimental group over the research period. The same group of subjects said they would like to continue learning Chinese through the use of computers, but no one wanted to write in Chinese even with the help of computers, according to the research data. Therefore, Hypothesis 1a was rejected.

Hypothesis 1b: There is no difference between different grade levels in promoting learning interest when using computers as a learning tool. Regarding the Hypothesis 1b, no significant difference was found across grade levels in terms of interest change or interest in continuing to learn Chinese. Therefore, Hypothesis 1b was not rejected.

Hypothesis 2: There is no difference in learning between American-born Chinese children who use computers as a tool for learning the Chinese language and those who do not use computers. A *t*-test was used to test the data for the second hypothesis. There was no evidence that students learned more in the Chinese school through the use of computers than through non-computer learning. Consequently, this hypothesis was not rejected.

Hypothesis 3: There is no difference in learning the Chinese language in the Chinese school between American-born Chinese children who speak Chinese at home and those do not speak Chinese at home. Multiple regressions, ANOVAs, and descriptive statistics were used to test the data for the third hypothesis. Even though speaking Chinese at home had an effect on subjects' obtaining higher average scores, it did not influence the same group of subjects' improving their pretest-posttest difference scores. The explanation for this was that

subjects who spoke Chinese to their parents at home might have grasped the language and the cultural norms better than those subjects who spoke English to their parents at home; thus, the former had higher average scores than the latter did. Being exposed to the language lessons in the Chinese school for a certain period of time, students who spoke English to their parents at home performed better on the posttest than they did on the pretest. That made their pretest–posttest difference scores higher than those of subjects who spoke Chinese at home. Thus, Hypothesis 3 was rejected.

Hypothesis 4: There is no difference in learning the Chinese language between American–born Chinese children with strong parental concern and those with not–so–strong parental concern. Students with strong parental concern had higher average scores but did not have higher pretest–posttest difference scores, whereas students whose parents were less concerned had higher pretest–posttest difference scores. Thus, Hypothesis 4 was rejected.

Conclusions

Most Chinese schools in the United States were originally established on the foundation of Chinese parents' desire for their American–born children to learn not only the American civilization and democracy but also the Chinese culture. These parents expect their children to build a language that may lead them to have better human relationships, to develop an attitude conducive to adapting within a multicultural environment, and to establish a base for philosophical thinking for living in American society (Tsai, 1994).

Parents and teachers of children attending Chinese schools in the United States have been trying to find a way to improve these youngsters' academic achievement in these schools since they were first established. However, it is difficult to promote American-born Chinese children's motivation to learn the Chinese language. Hence, the researcher's purpose in this study was to discover whether computers could help to promote American-born Chinese children's interest in learning in the Chinese school.

Using computers as a learning tool increased the learning interest of students in the experimental group over the research period. No significant difference was discovered across grade levels in terms of learning interest change. However, there was no evidence to indicate that learning Chinese language through the use of computers was better than non-computer learning.

Language spoken with parents at home and way of doing homework were related to students' average scores. Students who spoke Chinese to their parents at home had higher average scores than those who spoke English to their parents. Students in the comparison group who spent 20 or more minutes studying Chinese every day had higher average scores than other students.

Students in the comparison group who spoke English to their parents at home had higher pretest-posttest difference scores than their counterparts, after being exposed to Chinese in the Chinese school over the research period. Parent's concern contributed to higher average scores but not to higher pretest-posttest difference scores.

Discussions

Teachers

The researcher assumed that because parents were concerned more about their children's learning in the Chinese school, they would insist on a bilingual environment at home. This insistence, in turn, would promote American-born Chinese children's interest of learning the Chinese language or increase their performance in the Chinese school. The research results, nevertheless, were not as significant as the researcher expected.

In this research, the comparison group had higher different scores than the experimental group. Students who spoke English with parents at home also had higher different scores than those who spoke Chinese with parents at home. This led to the thinking that maybe something happened in the school so that one group of students had better performance than another group.

Classroom computer instructors are advised to design course materials well and test them on a student before placing the materials for use in the class. Like movie, slide and overhead projectors, the computer is merely an educational tool. Only can teachers make learning happen in a classroom. If the course materials are not well arranged to motivate the students, students may shortly become bored while using the computer. Computers should not be brought into a classroom, if there is no well-designed teaching plan. As Johnson (1991) states:

> "It is not the computer itself that affects interaction. Rather, factors that affect interaction are the nature of the tasks teachers devise and the way that teachers organize classroom interactions centered around computer work or mediated through the computer. Rich language use will not necessarily result simply from introducing computers into a classroom" (p. 77).

Discrepancies between the Lansing Chinese School and the Kansas City Chinese School

The discrepancies of school climates and teaching experiences between the Lansing Chinese School and the Kansas City Chinese School (page 41) might have an influence on the students learning and the research outcomes. Because teachers in the Lansing Chinese School changed every year, the students may reflect this inconsistency. The children may become confused by different teachers and a variety of teaching methods.

In the Lansing Chinese School most parents might want their children to be exposed to a Chinese spoken surrounding once a week. This attitude might affect the children's learning attitude in the Chinese school. Children in the Lansing Chinese School would perhaps consider the Sunday Chinese school as a place where students do not have to do the homework, prepare for the quiz, and obey the teacher.

This research did not have similar significant results as previous studies had on using computers to teach foreign languages. The students in the two Chinese schools used the same textbooks, were taught the same materials, and practiced in dyad. The only difference in discussion was that computers were adapted to help the students in the experimental group learn and practice the Chinese language. Another difference which was not in this research's domain was the teachers. The experienced teachers in the comparison group would have a powerful influence on learning. When things were arranged equally in the two schools, teachers would make the differences happen.

Teaching Materials

HyperCard is a lively computer database program for Macintosh. It is full of active elements which can be cultivated into pedology designs. HyperCard, if well planned, may be used to design sparkling and breathtaking course materials and to motivate students for teaching the Chinese language in the Chinese school in the United States.

If this research could be started all over again, the researcher would do something differently. The researcher would use HyperCard to develop teaching programs instead of adapting existing commercial software packages such as Microsoft Word, Excel, Works into teaching. It would be interesting to see different results and conclusions led by a different design of course materials.

School Staff and Parents' Attitude

Most Chinese schools in the United States were established by a group of involved parents. These parents would take turns performing the duties of principal and staff. Normally these parents were concerned about the coming generations' Chinese spoken environment. Their concern would usually constitute the school atmosphere which would affect teachers' lesson plans and strategies.

More often parents' attitude toward the school may be subtly passed to the children. For example, a student may be polite and follow the rules in a mainstream school, but the same student would probably not obey the teacher and talk to the classmate next to him/her all the time in a Chinese school classroom. This type of attitude of ignoring teachers and rules may be derived from parents. By the same token, a student may not take homework seriously nor prepare for a test in the Chinese school.

The climate in a Chinese school may have an influence on teaching and learning. Different attitudes in various Chinese schools in the United States may alter teaching strategies and, in turn, may result in different learning outcomes. It would be interesting to see a study done that reflects a variety of school attitudes, teaching strategies, and learning outcomes.

Recommendations

Based on the experience of using computers as a tool for learning Chinese and the foregoing findings, the following recommendations are made for future research:

1. This was a relatively short-term study. In addition, the effects of using computers as a language-learning tool may be influenced by the novelty of using technology. Thus, research on the long-term effects of using computers as a tool in learning a second language is recommended.
2. This study was an exploratory investigation, and the sample size was small. Further research with a larger sample is recommended.
3. Individual differences such as children's personalities, family climate, and parental age were not considered in this study. Further research including individual differences as variables is recommended.
4. The teacher's training and experience are important factors that directly affect students' learning. The variable of teaching experience was not considered in this study. Hence, further research including teaching experience is recommended.

APPENDIX A: BACKGROUND INFORMATION QUESTIONNAIRE

Student Data Sheet

Name: ___ Grade ___ Male ___ Female

Please mark the item(s) appropriate to your situation.

1. What language do you use when speaking to your parents at home?

   ____ English ____ Chinese

2. How much time do you spend on studying Chinese everyday?

   ____ More than 20 minutes ____ Less than 20 minutes

3. How do you do your Chinese homework?

   ____ A portion everyday ____ Finish in one morning/afternoon

4. Experiences of using computers:

   ____ Never touch it ____ Have some experiences

5. Do you like computers?

   ____ Don't like it ____ Like it

APPENDIX B: PHONETICS AND CHARACTERS THAT WERE TAUGHT

第一班注音符號、字詞教學
The First Level Class
Phonetics and Characters That Were Taught

I. Phonetics

ㄅ ㄆ ㄇ ㄈ ㄉ ㄊ ㄋ ㄌ ㄍ ㄎ ㄏ ㄐ ㄑ
ㄒ ㄓ ㄔ ㄕ ㄖ ㄗ ㄘ ㄙ ㄧ ㄨ ㄩ ㄚ ㄛ
ㄜ ㄝ ㄞ ㄟ ㄠ ㄡ ㄢ ㄣ ㄤ ㄥ ㄦ

II. Characters

鼠 (mouse)
牛 (ox)
虎 (tiger)
兔 (rabbit)
龍 (dragon)
蛇 (snake)
馬 (horse)
羊 (sheep)
猴 (monkey)
雞 (rooster)
狗 (犬) (dog)
豬 (swine)
色 (color)
身體 (body)
黑 (black)
紫 (purple)

頭 (head)
眼 (eye)
鼻 (nose)
口 (mouth)
耳 (ear)
手 (hand)
腳 (feet/foot)
紅 (red)
白 (white)
黃 (yellow)
綠 (green)
藍 (blue)
春 (spring)
夏 (summer)
秋 (autumn)
冬 (winter)

第二班字詞教學
The Second Level Class
Phrases That Were Taught

1. 雞蛋 (egg)
2. 吃飯 (having a meal)
3. 散步 (taking a walk)
4. 客廳 (living room)
5. 冰箱 (refrigerator)
6. 前面 (front)
7. 後面 (back)
8. 汽車 (automobil/car)
9. 臥房 (bedroom)
10. 草地 (lawn)
11. 生日 (birthday)
12. 澆花 (watering plant)
13. 釣魚 (fishing)
14. 甜點 (dessert)
15. 超級市場 (super market)
16. 讀書 (studying)
17. 唱歌 (singing)
18. 肥皂 (soap)
19. 很好吃 (tasty)
20. 水果 (fruit)
21. 高興 (happy)
22. 剪刀 (scissors)
23. 買東西 (shopping)
24. 牛肉 (beef)
25. 牛奶 (milk)
26. 麵包 (bread)
27. 蛋糕 (cake)
28. 香蕉 (banana)
29. 蘋果 (apple)
30. 橘子 (orange)

第三班字詞教學
The Third Level Class
Phrases That Were Taught

1. 逛街 (window shopping)
2. 日用品 (daily items)
3. 購物中心 (shopping center)
4. 停車場 (parking lot/ramp)
5. 書店 (book store)
6. 小吃店 (snack shop)
7. 存錢 (deposit money)
8. 領錢、提錢 (withdraw money)
9. 支票 (check)
10. 簽字 (signature)
11. 銀行 (bank)
12. 小姐 (miss)
13. 名牌 (popular brands)
14. 床單 (sheet for bed)
15. 毛巾 (towel)
16. 桌布 (table cloths)
17. 皮帶 (belt)
18. 花瓶 (vase)
19. 百貨公司(department store)
20. 小心 (careful, cautious)
21. 漸漸 (gradually)
22. 打破 (break something)
23. 對面 (face to face)
24. 重 (heavy)
25. 文具 (stationery)
26. 便條 (note)
27. 地圖 (map)
28. 漫畫 (cartoon)
29. 人類 (human being)
30. 世界 (world)

APPENDIX C: PRETEST

第一班注音練習
The First Level Class
Phonetics Test
Pre-Test 1

ㄅ	ㄏ	ㄕ	ㄈ
ㄒ	ㄊ	ㄋ	ㄌ
ㄍ	ㄎ	ㄆ	ㄑ
ㄐ	ㄙ	ㄉ	ㄇ
ㄟ	ㄚ	ㄥ	ㄧ
ㄩ	ㄘ	ㄨ	ㄥ

第一班認字練習
Character Recognition
Pre-Test 2

雞	黃
狗	綠
身體	夏
黑	秋
紫	冬

第一班翻譯練習
The First Level Class
Translation
Pre-Test 3

豬	藍
色	春
鼠	頭
牛	眼
虎	鼻

第二班翻譯練習
The Second Level Class
Translation
Pre-Test 1 (Oral Test)

Please translate the following Chinese phrases into English:

下午	過橋
窗子	說話
飛機	故事
月亮	手指
大河	眼睛

第二班造句練習
The Second Level Class Sentence Making Pre-Test 2

Please make sentences by using the phrases below.

1. 再見
2. 以爲
3. 爲什麼?
4. 請客
5. 沒關係
6. 同學
7. 電話
8. 打球
9. 聰明
10. 猜猜看

第二班填空練習
The Second Level Class
Fill-In-The-Blank
Pre-Test 3

Please fill in the blank in the following sentences with the correct phrase from the right column:

1. 我有一個妹妹和一個_____。
2. 媽媽正在擦_____。
3. _____你送我生日禮物。
4. 下雪了，窗外飄著一片一片的_____。
5. 你們猜猜看，這是_____？
6. 太陽下山了，_____了！
7. 晚上我們一起去看_____。
8. 姐姐喜歡照_____。
9. _____只有在晚上出來。
10. 很晚了，爲什麼還不_____？

鏡子
睡覺
電影
月亮
弟弟
天黑
雪花
牆壁
什麼
謝謝
天亮
還早
爸媽
太陽
兒孫

第三班翻譯練習
The Third Level Class
Translation
Pre-Test 1

Please translate the following Chinese phrases into English:

1. 食物 =
2. 吃飯 =
3. 衣服 =
4. 銀行 =
5. 附近 =
6. 常常 =
7. 高興 =
8. 買東西 =
9. 停車場 =
10. 有沒有?=

第三班造句練習
The Third Level Class
Sentence Making
Pre-Test 2

Please make sentences by using the phrases below.

1. 寫字
2. 春天
3. 小孩
4. 歷史
5. 銀行
6. 玩具
7. 電燈
8. 學校
9. 百貨公司
10. 因爲

第三班填空練習
The Third Level Class
Fill-In-The-Blank
Pre-Test 3

Please fill in the blank in the following sentences by using the correct phrase from the right column:

1. 我家有_____人。
2. 媽媽到市場_____。
3. 鋼琴的_____眞好聽。
4. 爸爸幫妹妹做_____。
5. 姐姐到銀行_____。
6. 不懂的地方要查_____。
7. 你喜歡聽_____嗎？
8. 他的衣服_____嗎？
9. 到了別人家，要先_____。
10. 我們在公園裡一邊_____，一邊聊天。

乾淨
音樂
敲門
烤肉
聲音
買菜
功課
五個
領錢
字典
如果
逛街
但願
值得
討論
風鈴

APPENDIX D: POSTTEST

第一班注音測驗
The First Level Class
Phonetics Test
Post-Test 1

ㄇ　ㄈ　ㄉ　ㄊ　ㄋ　ㄌ　ㄍ　ㄎ

ㄔ　ㄕ　ㄖ　ㄗ　ㄘ　ㄙ　ㄧ　ㄨ

ㄞ　ㄟ　ㄠ　ㄡ　ㄢ　ㄣ　ㄤ　ㄥ

第一班認字測驗
The First Level Class Characters Test
Post-Test 2

牛	夏
虎	黃
兔	手
色	眼
春	鼻

第一班翻譯測驗
The First Level Class Translation Post-Test 3

蛇	綠
羊	冬
猴	紅
狗 (犬)	秋
豬	藍

第二班翻譯測驗
The Second Level Class
Translation
Post-Test 1

Please translate the following Chinese phrases into English:

1. 剪刀 =
2. 客廳 =
3. 牛奶 =
4. 超級市場 =
5. 蛋糕 =
6. 水果 =
7. 買東西 =
8. 後面 =
9. 甜點 =
10. 汽車 =

第二班造句测验
The Second Level Class Sentence-Making Post-Test 2

Please make sentences by using the phrases below.

1. 讀書
2. 剪刀
3. 前面
4. 麵包
5. 草地
6. 牛肉
7. 高興
8. 雞蛋
9. 臥房
10. 香蕉

第二班填空测验
The Second Level Class
Fill-In-The-Blank
Post-Test 3

Please fill in the blank in the following sentences with the correct phrase in the phrase bank.

The Phrase Bank:

肥皂	散步	冰箱	很好吃
生日	浇花	吃饭	蘋果
釣魚	橘子	糖果	炒菜

1. _____皮是黃色的。
2. 姐姐喜歡吃_____。
3. 爸爸每天吃完晚飯都去_____。
4. 我準備好魚竿想到河邊_____。
5. 媽媽做的晚飯_____！
6. 爸爸裝好水管要_____。
7. 媽媽把菜放進_____裡。
8. 我用_____洗衣服。
9. 今天是媽媽的_____，所以，爸爸送她一個禮物。
10. 已經中午十二點，肚子餓了，該_____了！。

第三班翻譯測驗
The Third Level Class
Translation
Post-Test 1

Please translate the following Chinese phrases into English:

1. 逛街
2. 日用品
3. 購物中心
4. 停車場
5. 書店
6. 小吃店
7. 存錢
8. 領錢、提錢
9. 支票
10. 簽字

第三班造句測驗
The Third Level Class Sentence-Making Post-Test 2

Please make sentences by using the phrases below.

1. 銀行 (bank)

2. 小姐 (miss)

3. 名牌 (popular brands)

4. 床單 (sheet for bed)

5. 毛巾 (towel)

6. 桌布 (table cloths)

7. 皮帶 (belt)

8. 花瓶 (vase)

9. 百貨公司(department store)

10. 小心 (careful, cautious)

第三班填空測驗
The Third Level Class
Fill-In-The-Blank
Post-Test 3

Please fill in the blank in the following sentences with the correct phrase in the phrase bank.

The Phrase Bank:

地圖	認識	便條
重	人類	
對面	如果	打破
尊敬	文具	世界
缺點	漫畫	漸漸

1. 這是一張台灣的_____。
2. 這本_____書很好看！
3. 妹妹_____長高了。
4. _____有好幾千年的歷史。
5. 我不小心把花瓶_____了！
6. 銀行在郵局的_____。
7. 爸爸的書桌上有許多_____。
8. 這本書又厚又_____。
9. _____上有許多國家。
10. 老師寫了一張_____讓我帶回家給爸爸媽媽看。

APPENDIX E: LEARNING INTEREST SCALE

Learning Interest Scale for Students

Please answer these questions by circling the answer that best describes how you feel.
SA = "Strongly agree." **A** = "Agree."
U = "Undecided." **D** = "Disagree."
SD = "Strongly disagree."

Ex.	It is cold in Lansing in the winter.	SA	A	U	D	SD
1.	I am bored with learning Chinese.	SA	A	U	D	SD
2.	I like to write in Chinese.	SA	A	U	D	SD
3.	I would like to change the way we do things in Chinese school.	SA	A	U	D	SD
4.	Learning Chinese is boring when using the computer.	SA	A	U	D	SD
5.	I would like to continue learning Chinese through the use of a computer.	SA	A	U	D	SD
6.	I don't like to spend time on studying Chinese.	SA	A	U	D	SD
7.	I like to write in Chinese on the computer.	SA	A	U	D	SD
8.	The Chinese School is a good place to learn Chinese.	SA	A	U	D	SD
9.	My parents help me a lot in doing Chinese homework.	SA	A	U	D	SD
10.	My parents are concerned with my performance in Chinese School.	SA	A	U	D	SD

Learning Interest Scale for Parents

Please answer these questions by circling the answer that best describes how you feel.
SA = "Strongly agree." **A** = "Agree."
U = "Undecided." **D** = "Disagree."
SD = "Strongly disagree."

Ex.	It is cold in Lansing in the winter.	SA	A	U	D	SD
1.	My child is bored with learning Chinese.	SA	A	U	D	SD
2.	My child likes to write in Chinese.	SA	A	U	D	SD
3.	I would like to change the way they teach in Chinese school.	SA	A	U	D	SD
4.	My child feels that learning Chinese is boring through the use of a computer.	SA	A	U	D	SD
5.	My child would like to learn more Chinese through the use of a computer.	SA	A	U	D	SD
6.	I would like my child to perform well in the Chinese school.	SA	A	U	D	SD
7.	My child likes to use the computer to write in Chinese.	SA	A	U	D	SD
8.	Chinese school is a good place for my child to learn Chinese.	SA	A	U	D	SD
9.	I always help my child do his/her Chinese homework.	SA	A	U	D	SD

Comments:

APPENDIX F: PARENT AND STUDENT CONSENT FORM

Parent and Student Consent Form

We would like your child to participate in a study about the effects of using computers as a tool to learn Chinese as a second language by American-born Chinese children. Your child has been selected as a possible participant of this study because he/she is a student at either Lansing Chinese School or Kansas City Chinese School and is between the ages of 8 and 12. There will be 58 or 60 students in this study.

If you decide that your child will participate in this study, Yeong-Ming Jong, a doctoral candidate at Michigan State University, will collect information from two tests and three questionnaires. These scores will be coded so that your child cannot be identified.

Any of the information gathered as a result of this study will be kept strictly confidential. If you have any questions regarding this study, please call Yeong-Ming Jong, the primary investigator, at 517-353-7922.

Your signature indicates that you have read the information above and have decided to let your child participate in this study. You may choose to have your child stop participating in this study at any time.

Name of Child: ____ Yes ____ No

_____ _____

Signature of Student Date

_____ _____

Signature of Parent or Legal Guardian Date

APPENDIX G: INSTRUCTIONS FOR USING MACINTOSH SE

中文電腦操作須知(一)
Instructions for Chinese Computer System
Word Processing

一、進入文書處理：滑鼠的指標指著檔案夾MS Word，連續按兩下滑鼠鈕，打開這個檔案夾，找到MicroSoft Word™ ，連續按兩下滑鼠鈕，就進入文書處理了。

Enter Word Processing: Move the mouse pointer and point the folder "MS Word." Double click the mouse button to open up the folder. Find and point "MicroSoft Word™." Double click the mouse button to run the program.

二、選字體: 滑鼠的指標指著Font，按著滑鼠鈕不放，拉下操作指引，向下找到Mt-Kai Medium，然後放掉滑鼠鈕。

Change/Select Fonts: Move the pointer and point "Font." Hold on the mouse button and drage the pointer down. Find "Mt-Kai Medium" and let go the mouse button.

三、選字形: 滑鼠的指標指著Font，按著滑鼠鈕不放，拉下操作指引，向下找到18 Point，然後放掉滑鼠鈕。

Select Larger/Smaller Fonts: Move the pointer and point "Font." Hold on the mouse button and drage the pointer down. Find "18 Point" and let go the mouse button.

四、顯示注音鍵盤視窗: 滑鼠的指標指著螢光幕右上角的美國國旗，按著滑鼠鈕不放，拉下操作指引，向下找到「注音」，然後放掉滑鼠鈕。這時候螢幕上會出現注音鍵盤視窗，先在這裡輸入幾個中國字，然後按 Return 鍵。接著按 Command-Spacebar 離開注音鍵盤視窗。

Display Chinese Phonetic Keyboard Window: Move the pointer and point "American Flag." Hold down the mouse button and drag the pointer down to fourth line, then let go the button. You'll see the Phonetic Keyboard Window on screnn. Use the phonetics keyboard to type some Chinese characters in the window, then press "Return" key. Press Command-Spacebar at the same time to leave the phonetics keyboard window.

五、Toggle on/off Phonetic Keyboard Window: Press Command-Spacebar at the same time.

六、標點符號的輸入：在注音鍵盤視窗裡，先按「符」鍵再按「TAB」鍵，就會看到各式各樣的標點符號。

Input Puntuation: In Phonetic Keyboard Window, press "符" key, then "Tab" key.

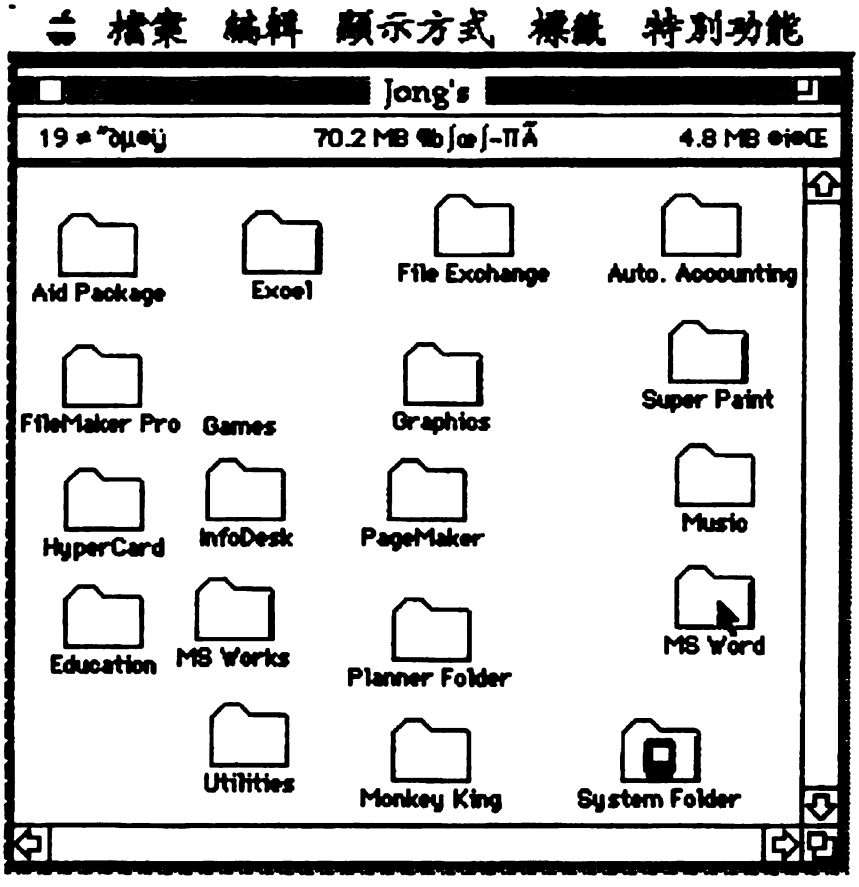
七、開始輸入/寫作

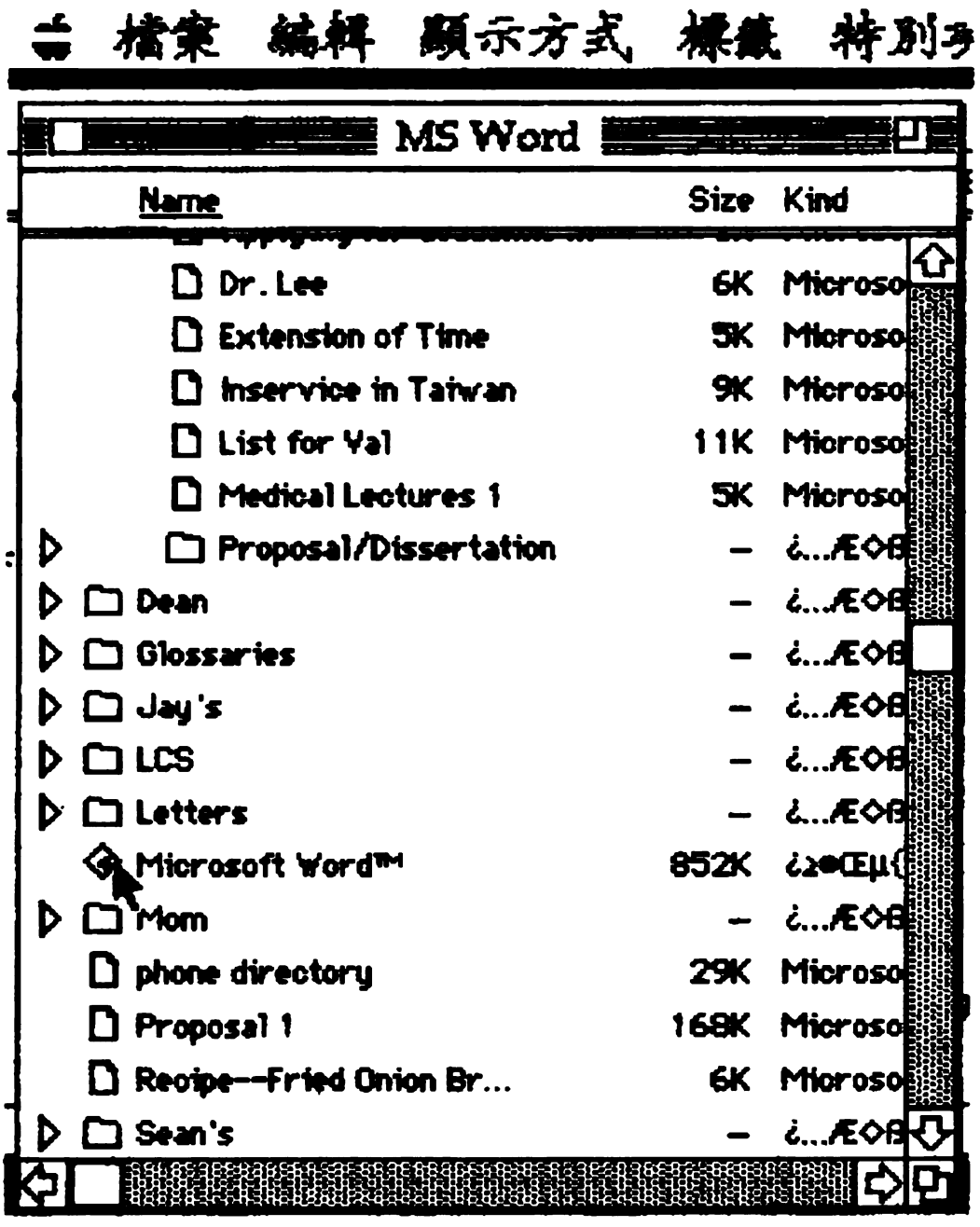
Start Typing or Composing

中文電腦操作須知
Instructions for Chinese Computer System

一、進入文書處理：滑鼠的指標指著MS Word檔案夾，連續按兩下滑鼠鈕，打開這個檔案夾，找到MicroSoft Word™，連續按兩下滑鼠鈕，就進入文書處理了。

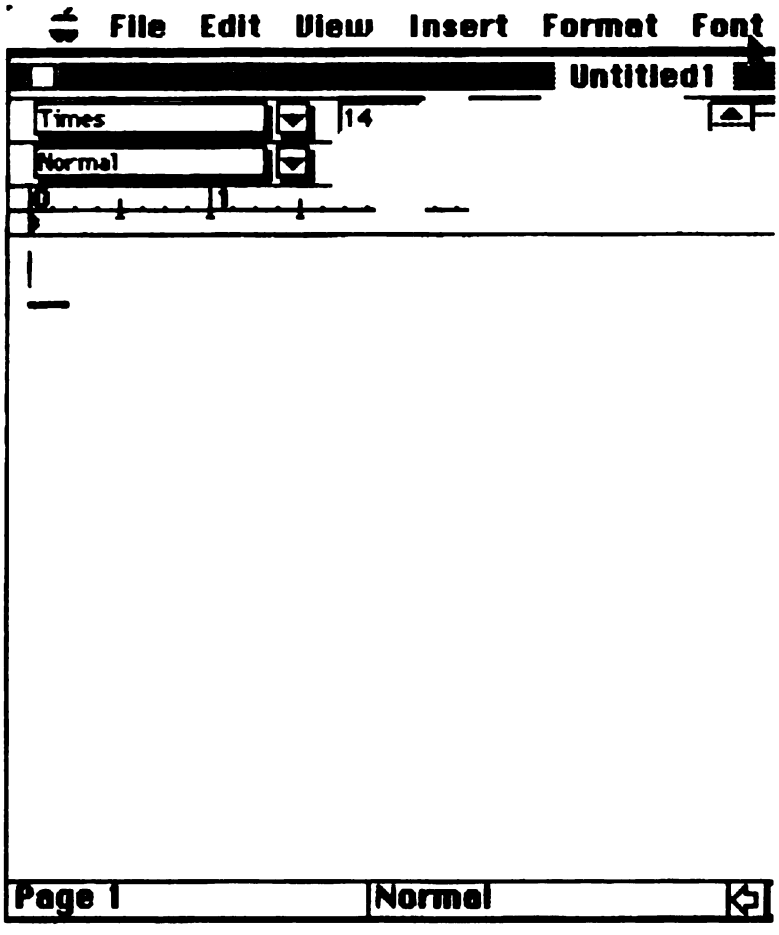
Enter Word Processing: Move the mouse pointer and point the folder "MS Word." Double click the mouse button to open up the folder. Find and point "MicroSoft Word™." Double click the mouse button to run the program.




檔案 編輯 顯示方式 標籤 特別
MS Word
Name
Size
Kind
Dr. Lee
6K
Microso
Extension of Time
5K
Microso
Inservice in Taiwan
9K
Microso
List for Val
11K
Microso
Medical Lectures 1
5K
Microso
Proposal/Dissertation
Dean
Glossaries
Jay's
LCS
Letters
Microsoft Word™
852K
Mom
phone directory
29K
Microso
Proposal 1
168K
Microso
Recipe--Fried Onion Br...
6K
Microso
Sean's

二、<u>選字體</u>: 滑鼠的指標指著Font，按著滑鼠鈕不放，拉下操作指引，向下找到Mt-Kai Medium，然後放掉滑鼠鈕。

<u>Change/Select Fonts</u>; Move the pointer and point "Font." Hold on the mouse button and drage the pointer down. Find "Mt-Kai Medium" and let go the mouse button.

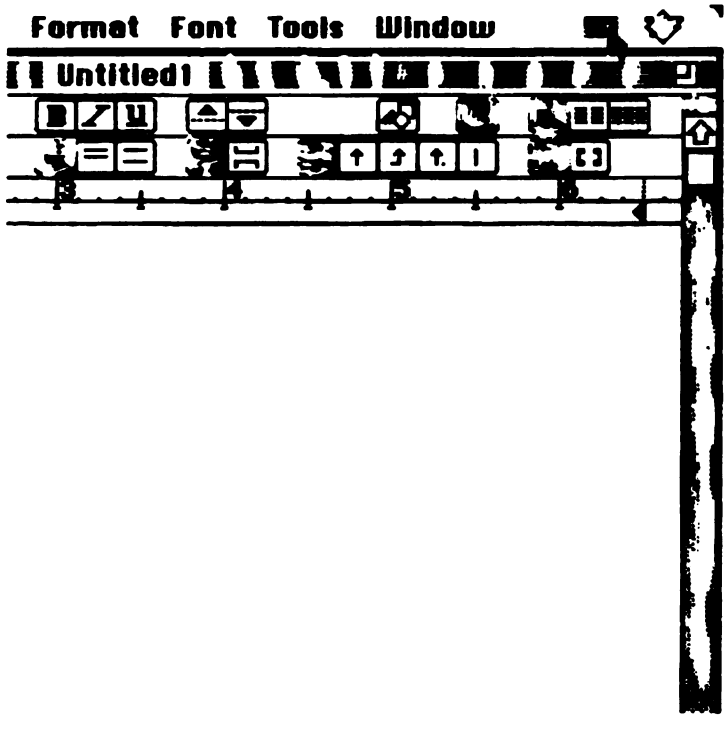


三、選字形: 滑鼠的指標指著Font，按著滑鼠鈕不放，拉下操作指引，向下找到18 Point，然後放掉滑鼠鈕。

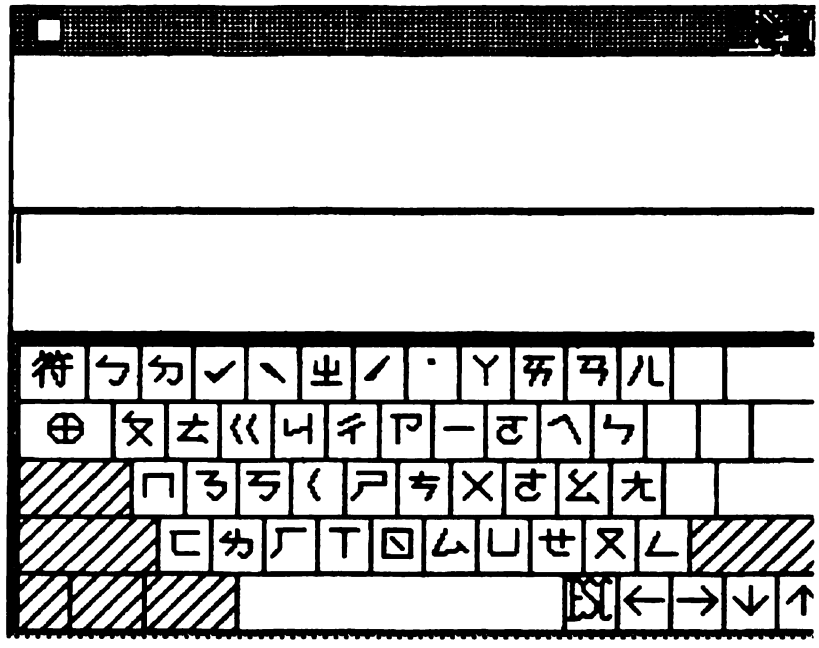
<u>Select Larger/Smaller Fonts</u>: Move the pointer and point "Font." Hold on the mouse button and drage the pointer down. Find "18 Point" and let go the mouse button.

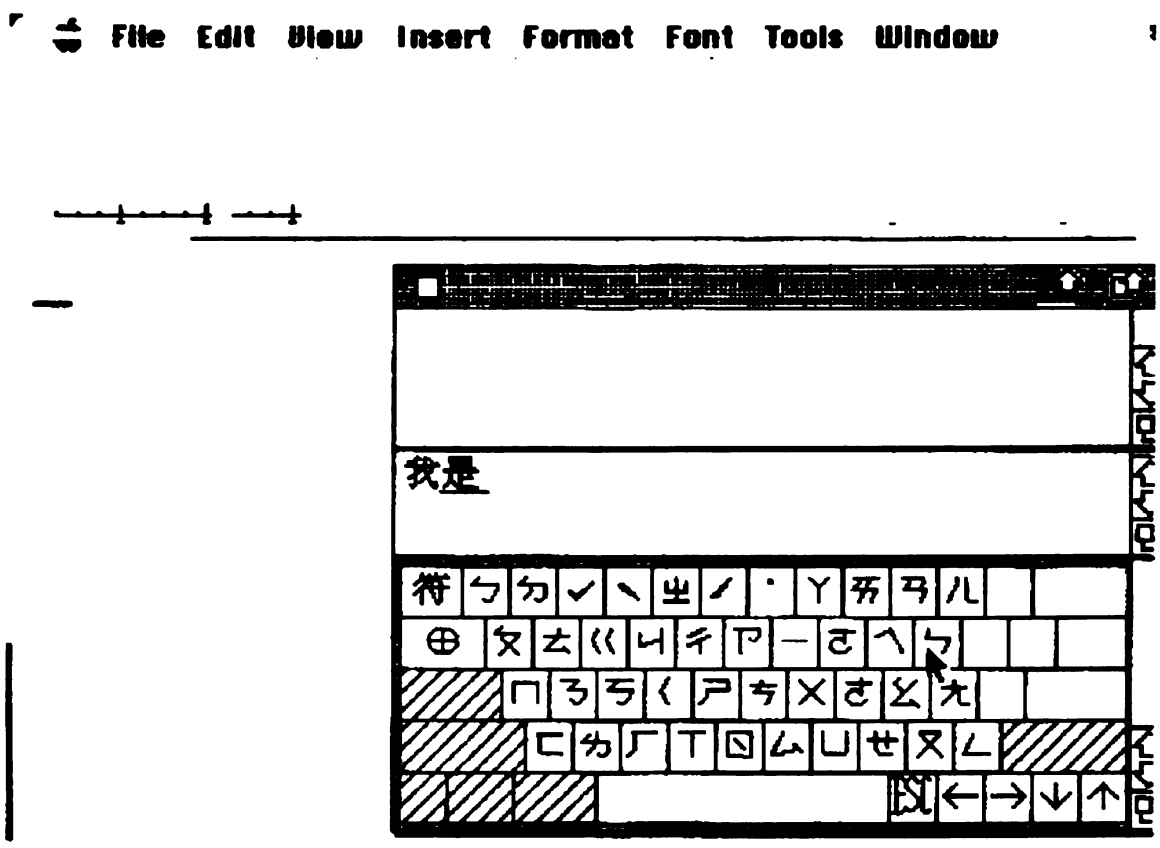
四、顯示注音鍵盤視窗: 滑鼠的指標指著螢光幕右上角的美國國旗，按著滑鼠鈕不放，拉下操作指引，向下找到「注音」，然後放掉滑鼠鈕。這時候螢幕上會出現注音鍵盤視窗，先在這裡輸入幾個中國字，然後按 Return 鍵。接著按⌘-Spacebar 離開注音鍵盤視窗。

Display Chinese Phonetic Keyboard Window: Move the pointer and point "American Flag." Hold down the mouse button and drag the pointer down to fourth line, then let go the button. You'll see the Phonetic Keyboard Window on scren. Use the phonetics keyboard to type some Chinese characters in the window, then press "Return" key. Press Command-Spacebar at the same time to leave the phonetics keyboard window.



File Edit View Insert Format Font Tools Window

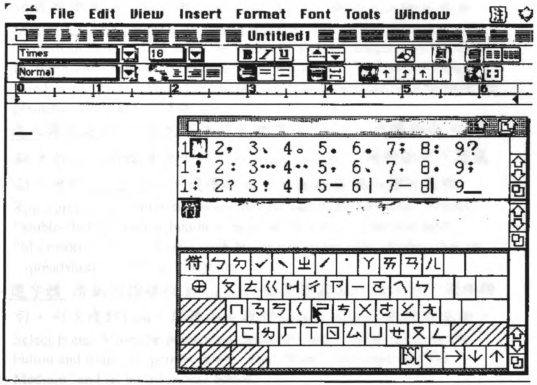




五、Toggle on/off Phonetic Keyboard Window: Press Command-Spacebar at the same time.

六、標點符號的輸入：在注音鍵盤視窗裡，先按「符」鍵再按「TAB」鍵，就會看到各式各樣的標點符號。

Input Puntuation: In Phonetic Keyboard Window, press "符" key, then "Tab" key.



七、開始輸入/寫作

Start Typing or Composing

中文電腦操作須知 (二)
Instructions for Chinese Computer System
Spreadsheet

一、顯示注音鍵盤視窗: 滑鼠的指標指著螢光幕右上角的美國國旗，按著滑鼠鈕不放，拉下操作指引，向下找到「注音」，然後放掉滑鼠鈕。接著按Command-Spacebar 離開注音鍵盤視窗。
Display Chinese Phonetic Keyboard Window: Move the pointer and point "American Flag." Hold down the mouse button and drag the pointer down to fourth line, then let go the button. You'll see the Phonetic Keyboard Window on screen. Press Command-Spacebar at the same time to leave the phonetics keyboard window.

二、進入簿記處理: 滑鼠的指標指著檔案夾 Works，連續按兩下滑鼠鈕，打開這個檔案夾，找到Microsoft Works ，連續按兩下滑鼠鈕，找到Spread Sheet，連續按兩下滑鼠鈕就進入簿記處理。
Run Spreadsheet: Move the mouse pointer and point the folder "Works." Double click the mouse button to open up the folder. Find and point "Microsoft Works." Double click the mouse button, then double click on "Spreadsheet" to run the program.

三、選字體: 滑鼠的指標指著Format，按著滑鼠鈕不放，拉下操作指引，向下找到Font，然後向左找到Mt-Kai Medium 放掉滑鼠鈕。
Select Fonts: Move the pointer and point "Format." Hold on the mouse button and drage the pointer down. Find "Font", then find "Mt-Kai Medium" and let go the mouse button.

四、選字形: 滑鼠的指標指著Format，按著滑鼠鈕不放，拉下操作指引，向下找到Size，然後找到18 point 放掉滑鼠鈕。
Select Fonts: Move the pointer and point "Format." Hold on the mouse button and drage the pointer down. Find "Size", then find "18 point" and let go the mouse button.

五、開始輸入
Start inputing information

中文電腦操作須知(三)
Instructions for Chinese Computer System Database

一、顯示注音鍵盤視窗: 滑鼠的指標指著螢光幕右上角的美國國旗，按著滑鼠鈕不放，拉下操作指引，向下找到「注音」，然後放掉滑鼠鈕。接著按Command-Spacebar 離開注音鍵盤視窗。
Display Chinese Phonetic Keyboard Window: Move the pointer and point "American Flag." Hold down the mouse button and drag the pointer down to fourth line, then let go the button. You'll see the Phonetic Keyboard Window on screen. Press Command-Spacebar at the same time to leave the phonetics keyboard window.

二、進入資料處理: 滑鼠的指標指著檔案夾 Works，連續按兩下滑鼠鈕，打開這個檔案夾，找到Microsoft Works ，連續按兩下滑鼠鈕，找到Data Base，連續按兩下滑鼠鈕就進入資料處理。
Run Data Base: Move the mouse pointer and point the folder "Works." Double click the mouse button to open up the folder. Find and point "Microsoft Works." Double click the mouse button, then double click on "Data Base" to run the program.

三、選字體: 滑鼠的指標指著Format，按著滑鼠鈕不放，拉下操作指引，向下找到Font，然後向左找到Mt-Kai Medium 放掉滑鼠鈕。
Select Fonts: Move the pointer and point "Format." Hold on the mouse button and drage the pointer down. Find "Font", then find "Mt-Kai Medium" and let go the mouse button.

四、選字形: 滑鼠的指標指著Format，按著滑鼠鈕不放，拉下操作指引，向下找到Size，然後找到18 point 放掉滑鼠鈕。
Select Fonts: Move the pointer and point "Format." Hold on the mouse button and drage the pointer down. Find "Size", then find "18 point" and let go the mouse button.

五、開始輸入
Start inputing information

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