*Full Length Research Paper*

# Research on the learning effects of multimedia assisted instruction on Mandarin vocabulary for Vietnamese students: A preliminary study involving e- learning system

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As Mandarin gains popularity in the whole world, Mandarin education becomes valued by the countries all over the world. The United Nations classifies Mandarin as one of the six major languages, and the number of people who learn Mandarin in the whole world grows with each passing day as the mainland China market grows. This study discusses the learning effects of using multimedia assisted instruction on Mandarin vocabulary for Vietnamese students, taking into account the difficulty that Vietnamese students encountered during the learning process of multimedia assisted instruction.

**Key words:** e- learning, multimedia assisted instruction, Mandarin vocabulary, Mandarin education.

## INTRODUCTION

### Research background and motive

Researches showed that the global Mandarin-speaking population exceeds 1.3 billion, approximately more than 300 million people are learning Mandarin and more than 2,500 universities in about 100 countries provide Mandarin courses; demand of people all around the world towards Mandarin learning becomes more and more urgent, so learning Mandarin has already become a global academic fashion (Cai, 2007). There are abundant and diverse Mandarin learning resources in Taiwan because of the innovation of Mandarin digital learning application technique and education technology and profound Mandarin research and education foundation

accumulated for many years, and Mandarin resources on the Internet that Taiwan provides comes out first (Yu-Hsin and Chang, 2010). For the current information technology, besides combining multimedia, the various functions provided by Internet teaching aids and tools could already assist and accomplish transnational and borderless Mandarin education (Shu, 2010).

Originally, teachers use books and oral communication to carry out the process of "learning"; however, the process of "learning" starts to change as technology advances. Language learning is restricted by time and space, so there are numerous examples of using technology to assist learning. Technological assistance brings brand-new learning experience to the learners, it not only provides hearing and visual stimuli to the learners, but also changes abstract oral communication instruction in a class to concrete learning experience (Liu, 2007). In recent years, computer assisted language

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learning (CALL) has been extensively used in various kinds of foreign language learning, because the computer could combine all kinds of multimedia tools to assist four requirements of foreign language learning, including listening, speaking, reading, and writing (Plass et al., 1998). With digital computer technology advancement and video media development, assisted learning teaching materials combine with computer and audio-visual storage media, namely interactive multimedia, come with the tide of fashion. Thus, media teaching materials could become more flexible and interactive depending on specific requirement, while the users also become more independent and have more control power because of the change of the form of media teaching materials. Consequently, the teaching environment and learning style at the current stage have been impacted gradually ( Hsu, 2004).

The content of multimedia teaching materials is an important part of CALL, while multimedia assisted instruction could process, save, and send such messages as sound, text, image, and animation comprehensively, and then a multimedia interactive learning environment is formed. This kind of environment could be excellent in both pictures and literary compositions, combine both action and still, blend sound and plot, and use vision and hearing at the same time, so as to provide lifelike effect when teaching (Guan, 2009). In a virtual environment with a large number of language information, the learners could learn language in a scenario (Joneset al., 2008) this environment could also provide interactivity to encourage the learners to participate in the interactive process actively and it is contributive to the learners to review learning material (Wang, 2010). Mayer and Moreno (2002) proposed numerous design principles of multimedia teaching materials and stated that teaching materials with written words and pictures allow the learners to produce multiple representations, which is contributive to long-term memory and pictures could promote learning and understanding better than written words. Although the diversification and sensual stimulation of digital media could serve as teaching materials and promote learners' learning motivation, some documents (Baylor, 2001; Conklin, 1987; Heo and Hirtle, 2001; Lemahieu, 2002; Murray, 2004; Yang, 2001) indicated that if appropriate cognitive strategy was not used in the learning of multimedia teaching material, cognitive overload might be increased, learners might have disorientation, or the interference of message processing would be produced and thus learning would be restrained (Liu, 2010).

Information is shown in multimedia through different ways and different appearances; multimedia not only brings more abundant visual and hearing enjoyment for people, but also increases the interest of learning and learning effect. As a result, the use of multimedia could present a lot of effects to the learners that the traditional teaching methods could not; if teachers could use information technology to show teaching material with audio-visual animation effect, then the learners' motivation could be aroused and the learners could understand and be familiar with what they learn more (Li, 2008). In Mandarin learning, the difficulty that the learners often face is that it is not easy for them to use the vocabulary and sentences learned in class; if daily life language could be blended into the daily life scenario to allow the learners to understand the ideas of language application, then this would be contributive to learning (South et al., 2008). The use of multimedia assisted instruction has already become a trend – using scenario to allow the learners to make use of specific pictures, animation, and sounds to assist them to learn abstract vocabulary, so as to achieve the purpose of language learning. This study planned to discuss how to combine Mandarin vocabulary with multimedia and assist Mandarin learners to learn effectively (Liu, 2007).

## Research purpose

According to the above-mentioned study motives, the main purposes of this study were as follows:

(1) Discuss the learning effects of using multimedia assisted instruction on Mandarin vocabulary for Vietnamese students.
(2) Understand the difficulty that Vietnamese students encountered during the learning progress of multimedia assisted instruction.

## LITERATURE REVIEW

### Functions of multimedia

Multimedia replaces the traditional teaching aid and becomes new favorite in the classroom; the following five functions were listed according to the viewpoints of several scholars (Yuen, 1991; Cai, 1994; Li, 1999; Lin, 2002; Lu, 2005; Chen, 2010a, b, c)

### *Specific learning experience*

Dale (1946) addressed "cone of experience", stating that "practice" directly was the easiest way for people to learn, visual media with "pictures" was the second easiest, and the learning experience provided by "Abstract" symbols was the third easiest. Therefore, the multimedia that blends "picture" and "abstract" provides considerably ideal degree of realism, which is corresponding to the model of enactive representation, iconic representation, and symbolic representation that a psychologist, Bruner, brought up.

### *Diversified teaching materials and sensual experience could strengthen learning effect*

A psychologist, Piaget, believed that the cognitive

development of human beings was related to the schema construction of personal experience message, integrating new message to the assimilation of existing schema, and the accommodation of amending the original schema or creating new schema. Therefore, multimedia combines the effects of sound, light, and animation to bring overall sensual stimulus to the learners, such diversified medias as the text, figure, image, sound, and music are contributive to people to recognize the construction, assimilation, and accommodation of schema, which is very helpful to the learners.

### Multimedia could arouse learning motivation

Multimedia could compose teaching materials using multiple methods. Compared to such static media as print media of textbooks and wall chart model, the acoustic-optic special effect and creative design of computerized multimedia are more lively and interesting, so it could arouse the extrinsic motivation of learners even more. In addition, the multimedia composed of high-quality teaching design could help arouse the intrinsic motivation of learners as well.

### Creating active learning activities is contributive to the communication between teachers and students and between classmates

The learners only need to pass their desires through text, images, and sounds, and then they could decide the courses that they accept according to individual differences once the teachers approve their desires, and they could also have move control power to learn according to their own ideas. In addition, the learners can communicate with the teachers through all kinds of communicative media; when the learners create their own study environment, they can study more calmly and discuss with classmates at the same time.

### Relationship between multimedia and teaching

During the teaching progress, the most common function of multimedia is to assist or support the teacher. The appropriately-designed instruction media could not only assist teaching, but also promote learning effect; their relationship is as follows (Hsu, 2004).

### Promote interaction between teachers and students

The use of multimedia to carry out discovery or discussion instruction to change the role of teacher in teaching and arrange students to participate appropriately; teachers change from the messenger of instruction information to the operator of instruction.

### Help teachers to teach suitably

The application of multimedia enables the teachers to have more flexibility and change while teaching, and the development of multimedia enables the teachers to understand the learning types and differences of students when teaching.

### Promote students' study capacity

The learners can practice themselves through multimedia repeatedly to train their ability to react and this is not restricted by time and space; thus, they could learn by themselves to obtain limitless learning capacity besides the limited teaching time.

### Characteristics of multimedia assisted instruction

The creation of scenario works in coordination with learning allows multimedia instruction to encourage the learners to think, explore, and develop initiatively, arouse the learning interests of the students, and elaborate the learning initiative, enthusiasm, and creativity of the students. Its characteristics are as follows (Guan, 2009).

### Change static to dynamic, arouse learning interest

The multimedia could turn a static thing into dynamic, so it could draw learners' attention and then arouse their learning interest more compared to traditional static assisted teaching aids.

### Change difficulty to ease, promote learning interest

Multimedia could simulate and change an abstract thing to an image, it not only presents all text, pictures, images, and sound in one, but also brings learners into lively and colorful instructional scenario; thus, the sense of the learners could feel the stimulation and deepen their understanding towards the matter.

### Interact and communicate, keep learning interest

Multimedia assisted instruction breaks the restrictions of time and space, supplement the deficiency of traditional classroom instruction structure, extend and widen instructional space, and strengthen interaction and communication.

### Teach with happiness, cultivate learning interest

Multimedia offers standard scenario oral reading and lively pictures plus interesting and vivid games, bringing learners to a relaxed and happy learning environment.

### Train the skill, strengthen learning interest

Relevant teaching materials of multimedia could train students to possess the information skill that the current society needs, so that the students could obtain and send the latest messages fast through relevant technology.

## Advantageous positions of multimedia teaching materials

A lot of scholars (Shi, 2003; Chen, 1997) believe that using the diverse characteristics of multimedia to assist instruction could not only strengthen the effect of Mandarin learning, but also spread Mandarin and Chinese culture to everywhere around the world through Internet. Thus, the advantageous positions of multimedia teaching materials are as follows (Liu, 2007).

### Blend the multimedia design with diverse teaching materials

The most convenient teaching aid for learning the second language would be computer undoubtedly. Ye (2001) pointed out that the modern second language teaching method promotes and flaunts authentic, meaningful, and interesting, so cooperating with computer is the best means to achieve this purpose. Multimedia could combine the picture, animation, sound, and text to assist learners, where the picture or animation could offset the deficiency of text and sound could allow the learners to experience the real scenario, which is favorable to the learning of language.

### Get beyond the time and region to allow learning to become more flexible

When you do a network search, you could find abundant learning resources but uneven quality from Internet, so the users' consideration towards teaching materials must change from "found or not" to "quality" (Ji et al., 2005). And the advantage of Internet - blurring the time and space limits - allows the learners to choose to learn at different time and location by themselves without the limitation of instructional time. In addition, the learner can review in accordance with their own learning pace in order to reach preciseness and familiarity.

## Relevant studies of multimedia and language learning

Because of high technology development, multimedia and Mandarin instruction has been valued by Mandarin teachers gradually, since the advantages of applying multimedia into Mandarin instruction are different from the traditional teaching strategy in the past. Experts and scholars (Zhang, 1998; Xie, 2002; Shelly, 2006) pointed out that the advantages of multimedia assisted instruction include strengthening learning motivation and attention of learners, increasing interactivity, satisfying individualized demand, monitoring the learning condition of learner, and non-space-time restricted Internet communication allowing the learners to learn by themselves at any time and any place (Cheng, 2009). The relevant studies of multimedia and language learning are as follows (Wang, 2010).

### Multimedia provides abundant information

Multimedia provides all kinds of information, creates abundant learning scenario, and combines existing technology, making language learning to have more assisted resources. In addition, online multimedia could also help the learners to cooperate with and learn from each other. Jones et al. (2008) mentioned that 3D environment could maintain learners' high motivation, increase interaction, promote schoolwork achievements, create virtual scenario, integrate various kinds of media contents and technology into a single interface, and help learners to learn language.

### Multimedia contributes to long-term memory

Animation includes text and pictures that could promote the production of multiple representations and is contributive to long-term memory. Mayer and Moreno (2002) indicated that the three characteristics of animation, picture, movement, and simulation, could present more intact knowledge information and strengthen learning. Based on Mayer's theory, Jones and Plass (2002) found that the animated content combined by text and pictures allows the learners to build psychological representation actively, so they could recall their memory easier when answering questions, namely the effect of long-term memory could be better.

### Need to avoid cognition overload

From the study regarding multimedia's influence towards children's vocabulary learning, Acha (2009) found that learning materials only showed text provided the best effect for children's vocabulary memory because children's cognitive ability was not as good. Learning materials only showed pictures or pictures plus text would cause cognitive overload to them. However, Acha (2009) also believed that pictures could create more abundant learning scenario, which is helpful to elaborating the meaning of text and profound understanding.

**Figure 1.** Front page of Mandarin vocabulary e-flashcards, global Chinese language and culture center (from http://edu.ocac.gov.tw/lang/basic/ch_cards/index.htm).

## RESEARCH METHOD

### Research subjects

The study subjects of this study were 11 students of Vietnamese class of a private technical school in Southern Taiwan. The age of these 11 students ranges from 18 to 26 years old, their nationalities are Vietnamese, and their mother language is Vietnamese. Since March 2011, they have taken Mandarin instruction courses for three hours, five days a week. Their Mandarin fluency level is primary.

### Research tools

Based on qualitative research method, participation observation and document analysis were adapted to carry out case study. The study period was three months, and the course progress was adjusted timely to match up with students' responses and levels. The methods used to collect data were explained as follows:

#### Participant observation

The researcher planned Mandarin learning course for the study subjects and multimedia assisted instruction was actually used. During the course period, the researcher observed and recorded the learning effects and difficulty encountered of study subjects towards Mandarin vocabulary; this record was the proof of study achievements, and it could also serve as a guide for instruction design amendment.

## RESULTS AND DISCUSSION

### Document analysis

The researcher considered multimedia teaching material as the core while teaching, and homework and tests were assigned regularly. "Placement test for multimedia learning" and "achievement test for multimedia learning"

that focused on vocabulary were implemented before and after the course to serve as the basis of learning effect observation. In addition, the researcher wrote instruction journal after each teaching to describe and record the teaching situation of the researcher and the learning situation of the students on every day. This journal was used when analyzing the learning effects and difficulty encountered of the study subjects.

### Research teaching materials

Since the study theme of this study was Mandarin vocabulary, so the demand and practicability related to life and culture were considered. The introduction of selected multimedia teaching materials was as follows:

#### Mandarin vocabulary e-flashcard

Global Chinese Language and Culture Center was established by overseas compatriot affairs commission. The Mandarin vocabulary e-flashcards (Figure 1) provided by this center are abundantly classified and clearly arranged, so they are very suitable to be used for assisted instruction. Moreover, the colors and typesetting of words of these e-flashcards are distinct, so they are suitable for self-learners as well.

#### Digital version for illustrated Chinese-English dictionary

Digital version for illustrated Chinese-English dictionary was edited by Hebron Soft Limited (Figures 2, 3 and 4).

**Figure 2.** Category page of Mandarin vocabulary e-flashcards, global Chinese language and culture center (from http://edu.ocac.gov.tw/lang/basic/ch_cards/03/index2.htm).
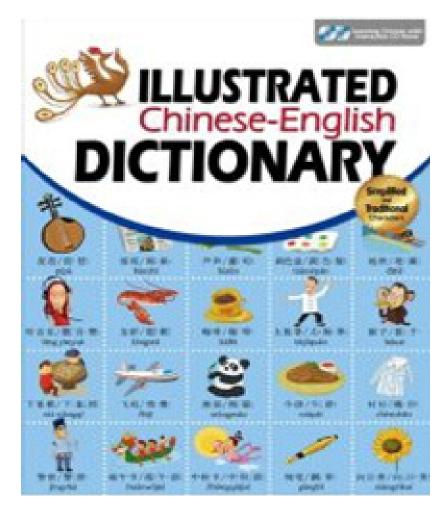


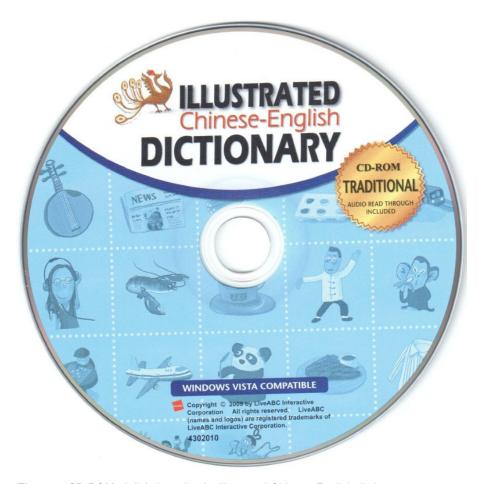**Figure 3.** Cover of digital version for illustrated Chinese-English dictionary.

**Figure 4.** CD-ROM of digital version for illustrated Chinese-English dictionary.

**Table 1.** Contents of Mandarin vocabulary e-flashcards, global Chinese language and culture center.

| Name of teaching material | Mandarin vocabulary e-flashcard |
| --- | --- |
| Publishing company | Overseas compatriot affairs commission (global Chinese language and culture center) |
| Multimedia format | Instruction website |
| Brief introduction | The instruction interface of this website provides three kinds of phonetic symbols, including Taiwan's phonetic symbols, Chinese phonetic symbols, and universal phonetic symbols respectively. The vocabulary includes 16 units - human body, animals, poultry and birds, insects, water organisms, plants, vegetables, fruit, food, electrical home appliances, articles for daily use, musical instruments, architectures, sports games, transportation, characters and professions. Every unit is divided into basic level and advanced level, which is favorable for the learners to advance gradually; the learners could also select contents of appropriate level (as shown in Figure 2) according to their need. Flashcard, pronunciation, example sentence, and writing stroke order for Chinese characters are provided for every vocabulary. |

The contents of the disc make use of scenario simulation to serve as classroom assisted instruction that is very appropriate. It also provides digital diverse exercises, allowing the learners to be familiar with the contents naturally, so it is a very good material for the learners to study independently (Tables 1 and 2).

**Conclusion**

***Design of study***

ASSURE instructional design model that was proposed by Heinich et al. (2002) is a good tool of systematic

**Table 2.** Contents of digital version for illustrated Chinese-English dictionary.

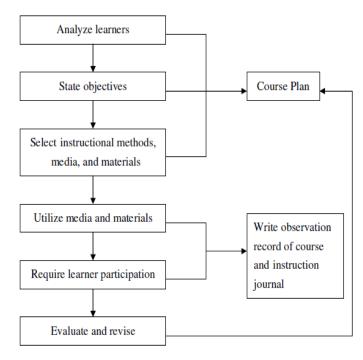| Name of teaching material | Digital version for illustrated Chinese-English dictionary |
|---|---|
| Publishing company | Hebron soft limited. |
| Multimedia format | Written teaching materials and instruction CD. |
| Brief introduction | Both textbook and CD provide traditional Chinese and simplified Chinese. Phonetic symbols include Taiwan's phonetic symbols and Chinese phonetic symbols. English definitions for vocabulary are provided and corresponding pictures are presented for every vocabulary. There are 15 main categories, 87 daily life themes, and 1,700 selected useful vocabularies for daily life use. Daily life themes include home, food, restaurants, clothes, cities, hospitals, and education; recreational themes include traffic, aviation, entertainment, and sports; knowledge themes include people, education, animals and plants, time, and geography. In addition, relevant units for vocabulary regarding Chinese culture such as night market culture, dining etiquette, cheongsam culture, Chinese style music, and traditional mascots are also included. The enclosed interactive CD-ROM (as shown in Figure 4) provides virtual environment and real-voice pronunciation without the restriction of network stability, which is contributive to the learners to understand and memorize the contents; it also makes Mandarin learning become more interesting. |



**Figure 5.** Flow chart of study design.

A - Analyze learners,
S - State objectives,
S - Select instructional methods, media, and materials,
U - Utilize media and materials,
R - Require learner participation,
E - Evaluate and revise (Huang, 2009).

***Milestone***

To reach the purpose of this study, the instruction style designed by this study mainly rested on ASSURE instructional design model. For the course or unit design of multimedia assisted instruction, this model focuses on designing instruction media that could be practically applied in the classroom and precisely used in the planning of assisted instruction or unit activity; thus, this model is the systematic plan that assists the teachers to use multimedia effectively when teaching. This study planned its implementation steps based on this model, and its flow chart was shown in Figure 5.

**ACKNOWLEDGEMENTS**

instructional design model for teachers to implement the fusion of information technology and instruction in the classroom. ASSURE focuses on selecting and making the best of multimedia tools to help reaching the instruction goal carefully under the actual instruction situation, it also encourages the learners to interact and participate. The name, "ASSURE", comes from the initial letters of its six steps so as to express the meaning of "assuring the effective use of instruction media". The six steps include:

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