A Virtual Zoo-based Learning Approach to Improving Students' Learning Performance and Attitudes in Chinese Language Course

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Abstract: The purposes of this study are to investigate how Computer Multimedia Chinese language learning (CMCLL) can enhance Chinese language learning in the classroom and how students can enjoy learning activities with vocabulary and pronunciation about an animals. Thailand educators believed that Chinese language has become as important as the English language. We developed computer multimedia for learning Chinese language which has been an important foreign language in Thailand. However, the study of Chinese language has many problems and difficulties for understanding because the students are not interested and not tried to learn. Therefore, further studies are needed for developing multimedia in order to enhance students' learning Chinese vocabulary and pronunciation with learning activities in CMCLL. In this study, an experimental design including pre-test and post-test group was used to define the efficiency of the CMCLL. There were 31 students in the control group and 34 students in the experimental group. The results of the analysis indicate that the CMCLL is quite effective, improving students' learning achievements and students' learning progression. In addition, the students reveal positive attitudes toward CMCLL.

Keywords: Computer-assisted language learning (CALL), Chinese language, Story-telling multimedia

1. Introduction

With the development of Computer Assisted Language Learning (CALL), various researches have attempted to adapt technology computer for teaching and learning foreign language that focus on English language learners (Chang, Lin, & Tsai, 2013; Feng & Cheng, 2014; Ferrer et al., 2015; Khan & Joho, 2014; Osipov, Prasikova, & Volinsky, 2015; Wang, Waple, & Kawahara, 2009). However, Chinese language is one of the important language for communication in the world, but Chinese language is considered to be a difficult language to learn. Therefore, many researchers have proposed a number of approaches for using computer in Chinese language teaching (Stickler & Shi, 2013; Xie, 1999). At present, Thailand educators believed that Chinese language has become as important as the English language. Thus, many curriculums in Thailand added Chinese language subject for learning in educational system. Especially, several primary schools have added Chinese language as a supplementary subject for primary students. The textbook is basic material for students to learn in Thailand. Moreover, the textbook has several flaws. For example, there is no color or illustration to attract students. The textbook contents are quite long so students cannot learn attentively.

In this study, we developed a computer multimedia for learning Chinese language which has become as an important foreign language in Thailand. However, the study of Chinese language has many problems and difficulties for understanding because the students are not interested and not tried to learn. Therefore, further studies are needed for developing multimedia in order to enhance students' learning in Chinese vocabularies and pronunciation with learning activities in CMCLL. Consequently, the purpose of this study is to investigate how Computer Multimedia Chinese language learning (CMCLL)

enhance students' achievement and how students' attitudes toward Computer Multimedia Chinese language learning (CMCLL).

2. Development of CMCLL

In this study, we designed a story-telling based computer multimedia for learning Chinese vocabularies and pronunciation. In the story, students are having a field trip at the zoo. The multimedia consists of texts, pictures, audio, animation, and video that enhance students' learning. We simulated the situation of the zoo in order to motivate the students learning. After that, the students can learn and play the activities from CMCLL. The material of Computer Multimedia Chinese language learning was created with Adobe Flash CS5.5, Adobe Photoshop CS5.5, and Nero Wave Editor software. Figure 1 shows the structure of the CMCLL.

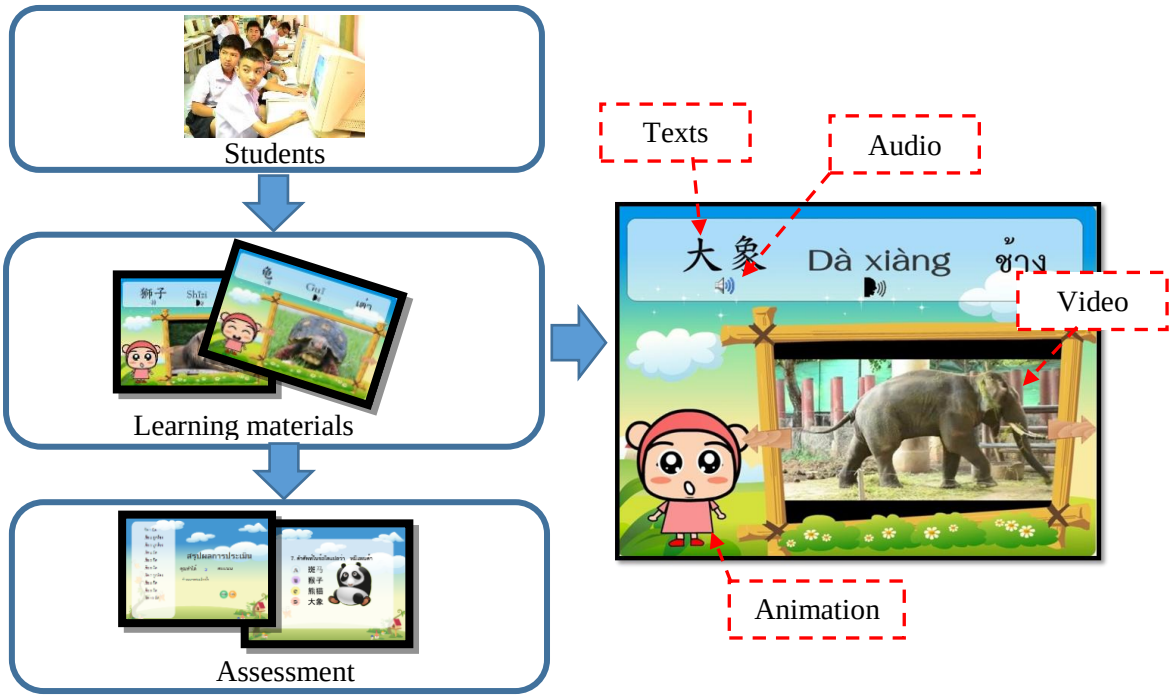

Figure 1. Structure of Computer Multimedia Chinese language learning

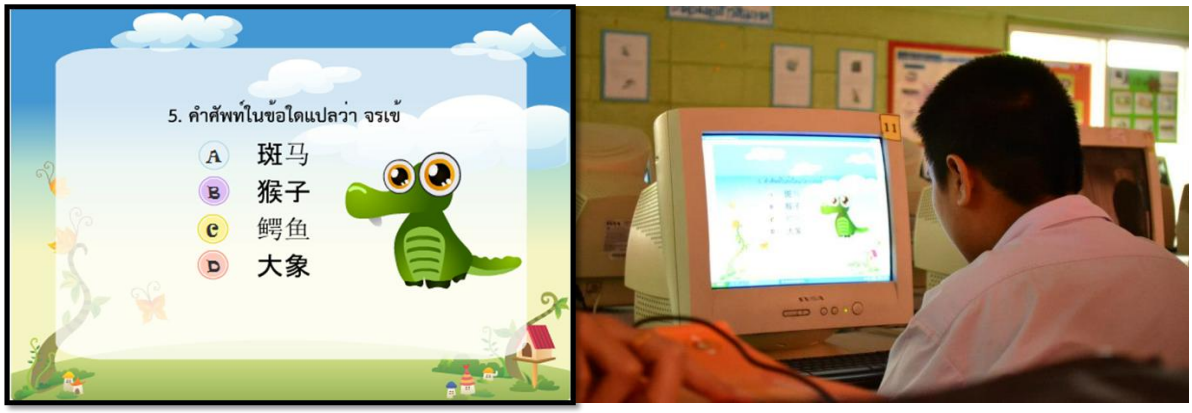

Figure 2. Illustrative examples of student learning activities

3. Research Design and Method

Sixty-four students were selected from a primary school in central Thailand. The students were randomly divided into two groups. Students in an experimental group (n=34) received Computer Multimedia Chinese language learning (CMCLL) in which they would learn by themselves with their own learning pace; while students in a control group (n=31) received a traditional learning (textbook-based learning). 20-item of the pre-and post-tests related to vocabularies and pronunciation of animals in Chinese was used. Before they participated in this study, they took a pre-test to measure whether they had equivalent prior knowledge. After that, both groups have two hours for learning and then they took a post-test to evaluate learning performance, followed by the attitude questionnaire. The KR-20 value showed that the reliability of this test was 0.78, indicating that the test is reliable.

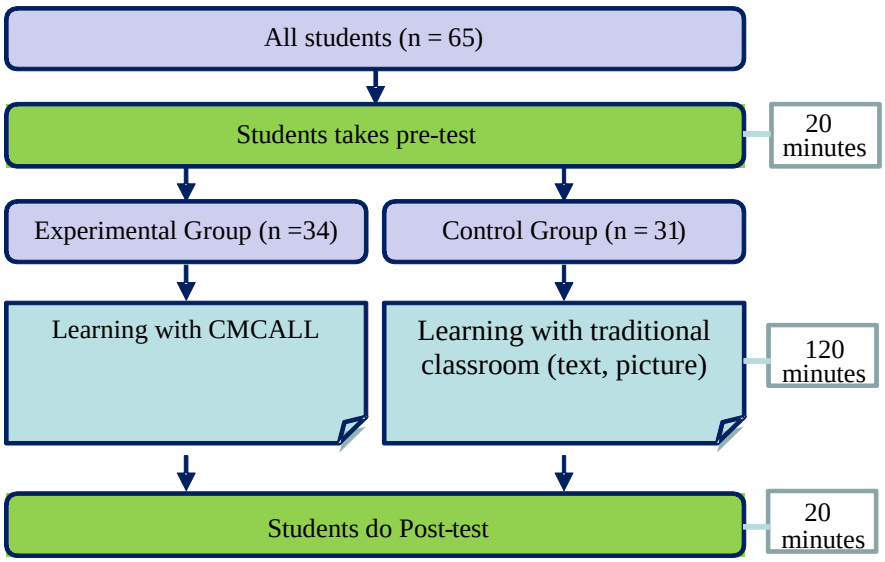

Figure 3. Experiment procedure

4. Research Results

Table 1 shows the *t*-test results of the mean scores and standard deviations of the pre-test scores of students in experimental group (EG) was 8.32 (SD = 2.17), and control group CG was 8.48, (SD =1.86) respectively. It is found that the test scores of the EG and CG did not significantly differ with $t = 1.669$ and p value > 0.05, indicating that the two groups of students had equivalent prior knowledge.

Table 1: T-test results of the conceptual pre-test for the two groups of students

Groups	N	Mean (S.D)	*t*	*p*
EG	34	8.32 (2.17)	1.669	.376
CG	31	8.48 (1.68)		

Table 2 shows that the EG achieved significantly better performance than the CG with $t = 1.675$ and p value < 0.05, implying that the learning achievement of the EG was better than that of the CG. We have found that two groups of students had equivalent prior knowledge before participating in the learning activity. After finishing the learning activity, the post-test scores of experimental group was 17.76, (SD = 1.68), and control group was 14.87 (SD = 2.65), respectively.

Table 2: T-test results of the conceptual post-test for the two groups of students

Groups	N	Mean (S.D)	*t*	*p*
EG	34	17.76 (1.89)	1.675	.000*
CG	31	14.87 (2.65)		

* $p < .05$

The normalized gain (<g>) (Hake, 1997, 2002) is employed to investigate students' conceptual learning progression. The range is that if the (<g>) $\geq$ 0.7 meaning High progression, while 0.7$\leq$ (<g>) $\geq$ 0.3 meaning Medium progression, and (<g>) < 0.3 meaning Low progression. In Table 3, the results shows that experimental group of students gained better conceptual knowledge after participating in the CMCLL and the progression of their knowledge was reasonably high progression, while the control group of students was medium progression.

Table 3: The student scores in this study.

Group	N	Tests	Mean	SD	Normalized gain	Interpretation
Experiment	34	pre-test	8.32	2.17	<g> = 0.81	High progression
		post-test	17.76	1.68		
Control	31	pre-test	8.48	1.86	<g> = 0.55	Medium progression
		post-test	14.87	2.65		

The questionnaire was adapted from Liaw (2008) attitude questionnaire, and employed a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree." This questionnaire consisted of ten items divided into four categories: behavioral intention, perceived usefulness, perceived satisfaction, and multimedia instruction that shown in Table 4.

Table 4: The students' responses to the questionnaire showing their attitudes toward CMCLL

Items	Mean	SD.	Remark
Behavioral intention:	*4.28*	*0.61*	Agree
I intend to use CMCLL to assist my learning.	4.26	0.56	
I intend to use CMCLL content to assist my learning.	4.29	0.67	
Perceived usefulness:	*4.36*	*0.58*	Agree
I believe CMCLL contents are informative.	4.62	0.49	
I believe CMCLL is a useful learning tool.	4.15	0.73	
I believe CMCLL contents are useful.	4.32	0.53	
Perceived satisfaction:	*4.29*	*0.66*	Agree
I am satisfied with using CMCLL as a learning assisted tool.	4.15	0.73	
I am satisfied with using CMCLL functions.	4.18	0.62	
I am satisfied with learning contents.	4.44	0.65	
I am satisfied with multimedia instruction.	4.41	0.65	
Multimedia instruction:	*4.51*	*0.59*	Strongly Agree
I like to use voice media instruction.	4.44	0.55	
I like to use video media instruction.	4.53	0.55	
I like to use multimedia instruction.	4.53	0.65	

In information of students' attitude towards CMCLL usage was presented in Table 4. From behavioral intention (Mean = 4.28) they believe that CMCLL can assist learning and perceived usefulness (Mean = 4.36) and perceived satisfaction (Mean = 4.29), it seems that learners intended to use the CMCLL for learning. Considering multimedia instruction (Mean = 4.46), it's found that they like to use multimedia on CMCLL.

5. Conclusions and Discussion

The general aim of this study is to propose a development Computer Multimedia Chinese language learning (CMCLL) to enhance student's foreign language and to study students' achievements and attitudes. The results showed that the developed CMCLL has been considered as a critical factor not only to improve the students' conceptual learning progression but also promote positive satisfaction. In addition, we found that they can remember vocabulary and pronunciation correctly. Therefore, we assume that CMCLL could make Chinese vocabulary learning easier. Based on the findings presented above, following proposals can be made for future studies.

To make this application effectively applied to the context, CMCLL can be further redesigned by integrating following personalized capabilities: 1) identifying student's learning styles to provide more appropriate learning activities and 2) diagnosing students' learning problems and providing learning suggestion to help student learn meaningfully (Hwang, Tsai, Tsai, & Tseng, 2008).

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