

The effects of game-based practice on young learners' vocabulary acquisition in learning Chinese Language

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This study investigated the effects of game-based practice on year three pupils' vocabulary acquisitions in the Chinese language classroom. Two different teaching practices were adopted, i.e. a game-based practice for the experimental group and a conventional based practice for the control group. The teaching program was the same for both groups. Each group had 30 pupils which were randomly assigned. Data was collected through a vocabulary acquisition test. Statistical results revealed that there were no significant differences between the two groups on vocabulary acquisition test. However, the middle vocabulary level pupils in the experimental group made significant improvement and performed as well as the high vocabulary level pupils. When tested separately, the pupils of high, middle and low vocabulary levels in the experimental group significantly performed better than those in the control group. These positive results offer a notable incentive to language teachers to include game-based practice in their teaching of vocabulary.

Keywords Games, game-based learning, vocabulary, Chinese vocabulary, vocabulary acquisition, young learner.

Introduction and background of the study

In the Malaysian Education System, the current Chinese Language syllabus for Chinese primary schools aims to equip pupils with skills and provide a basic understanding of the Chinese Language so that they are able to communicate, both orally and in writing, in common everyday situations (Kementerian Pelajaran Malaysia, 2011). It also enables pupils to read and to understand different kinds of texts for enjoyment and information. Chinese language acquisition requires the use of vocabulary as the most basic building blocks underlying the reading process (Fu, 2005; Ma, 2004). Therefore, the teachers are required to apply classroom strategies which are learner-centred, prepare pupils to use language in real life situations and most importantly provide a fun learning environment.

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However, in order to communicate well or enjoy Chinese reading, pupils must acquire an adequate number of Chinese vocabularies and should know how to use them accurately (Kementerian Pelajaran Malaysia, 2011). In language acquisition, vocabulary plays an important role which links the four skills of speaking, listening, reading and writing (Nguyen & Khuat, 2003). Since vocabulary is an important aspect of language, it is important for learners to acquire adequate vocabulary so that they can carry basic communication with others.

Studies have found that vocabulary is the main difficulty of all Chinese language learners at different levels, and it is also the main problem in all the learning processes of Chinese speaking, listening, reading and writing (Gao, Li & Guo 1993). Because of the challenging nature of Chinese vocabulary and the lack of necessary Chinese word knowledge, it is difficult for Chinese language learners to identify and isolate units of meaning, to build up Chinese character networks, and to demonstrate intratextual perceptions (i.e. how different parts of a text are integrated into a coherent discourse structure) in Chinese reading; thus, the development of Chinese reading proficiency is seriously hindered (Everson & Ke 1997).

When dealing with Chinese vocabulary acquisition, there is a consensus that Chinese character recognition is a challenging aspect because the Chinese writing system is totally different from an alphabet spelling system (Yun, Liang & Hooi, 2011). Chinese learners have to remember whole words aurally as well as graphically and learning Chinese require a unique memorizing effort: remembering thousands of new words, along with their tones and characters (Fu, 2005). Fu also claimed that the different tone of spoken Chinese is one of the most difficult skills to master which frustrates many learners and is also a widely recognised problem with Chinese language education. Due to the challenging nature of Chinese vocabulary, it is important that instructors provide a supportive environment for learners; not only meaningful exposures to language but learners need many opportunities for language interaction.

Nguyen and Khuat (2003) investigated the effectiveness of learning vocabulary through games. The research revealed that games bring in relaxation and fun for learners, thus helping them learn and retain new words easily. Xia (2011) also agreed that the use of vocabulary games such as charades, word puzzle and jeopardy help her students review vocabulary. Xia further added that learners love games and games have the positive effect of making learner participate actively and promoting vocabulary acquisition. Children love playing games and research have indicated significant learning advantages of using games in language learning classrooms (Li, 2012; Luu, 2012; Nguyen & Khuat, 2003; Wright, Betteridge & Buckby, 2005).

Using games as a learning approach seems to enhance learner's learning in the Malaysian classroom as Zuhaira (2007) in her study found that most of the learners feel that games help them to understand the subject content. Other studies also indicated that by using games learners gain higher motivation to study and they are more motivated to learn (Roslina, Rasimah, Hasiah & Azizah, 2011; Zuhaira, 2007).

However, a conventional approach of teaching is deeply teacher-centred in which teachers serve as the source of knowledge while learners serve as passive receivers (Kuzu, 2007). In comparison, game-based learning can create a more social and cultural world that helps individuals learn by integrating thinking and social interactions (Shaffer, Squire, Halverson & Gee, 2005). Xia (2011) states that learning Chinese vocabulary should be based on the learners' active engagement in constructing understanding, not simply on passive receiving information from a text or lecture. As Pivec and Dziabenko (2010) suggested the learning process should be interesting, easy and fun to learn.

Many experts of language teaching methodology (e.g, Ersoz, 2000; Hadfield, 1999; Lee, 1995; Richard-Amato, 1988; Schmitt, 2000; Sökmen, 1997; Thornbury, 2002 & Uberman, 1998) agreed that playing games is a good way to learn vocabulary. Games have been shown to have advantages and effectiveness in learning vocabulary in various ways (Luu, 2012). With the use of games, the teacher can create various contexts in which learners have to use the language to communicate, exchange information and express their own opinions (Wright, Betteridge & Buckby, 2005). Games are useful and effective tools that should be applied in vocabulary classes (Lee, 1979; Richard-Amato, 1988). The use of games is a way to make the lessons more interesting, enjoyable and effective (Deesri, 2002; Nguyen & Khuat, 2003).

Although vocabulary learning has been the subject of many studies (e.g, Azwar Arifin, 2009; Li, 2012; Luu, 2012; Nguyen & Khuat, 2003; Zhang, 2010), most of these studies of vocabulary learning and teaching focus on English Language. Few studies have investigated the teaching and learning of Chinese vocabulary acquisition (Fu, 2005). Even less is studied looking at using games to teach vocabulary in language classrooms in Malaysia (Lee, 2012). So, much is needed to know about using games as a teaching tool to improve learners in learning Chinese language vocabulary. Hence, the purpose of this study is to investigate the effect of game-based practice on vocabulary acquisition by year three pupils in a Chinese school towards using games in vocabulary practice.

Based on the objective of the study, the study attempts to address the following research questions:

1. Do pupils in the experimental group who were taught using game-based practice have performed better in vocabulary acquisition as compared to pupils in the control group who were taught using conventional practice?
2. Do pupils of high, middle and low vocabulary levels in the experimental group who were taught using game-based practice have performed better in vocabulary acquisition as compared to pupils of high, middle and low vocabulary levels in the control group who were taught using conventional practice?

Research hypotheses

The following research hypotheses are formulated to answer the research questions:

H₁: Pupils who were taught using game-based practice would perform better in vocabulary acquisition when compared to pupils who were taught using conventional practice.

H₂ : Pupils of high, middle and low vocabulary levels who were taught using game-based practice would perform better when compared to pupils of high, middle and low vocabulary levels who were taught using conventional practice.

Chinese vocabulary pedagogy

In Malaysia Chinese primary schools, literacy or word recognition is a focus at the beginning level of Chinese language learning (Kementerian Pelajaran Malaysia, 2011). Elementary grades learners (year one to year three pupils) need to know a number of words as soon as possible to enable the learners acquire Chinese reading at the early stage and to achieve the goal of independent reading so as the learners are fully prepared to learn Chinese language. Usually, word recognition is easier than to character writing;

therefore, literacy concern more on word recognition and less character writing practices (Kementerian Pelajaran Malaysia, 2011). Word recognition generally includes three fundamental features: form identification, phonetic activation and semantic encoding which are directly related to vocabulary performance and reading achievement (Ke, 1993) (as cited in Dai, 2010, p.3). Hence, literacy teaching should pay more attention to the associations of word forms, sound (pronunciations) and meaning.

This fact shows that, at the beginning level, vocabulary learning in fact is largely a process of character learning. Although the total number of Chinese characters is huge, only approximately 1,500 characters need be learned by year three pupils in Malaysia Chinese primary schools (Kementerian Pelajaran Malaysia, 2011). Nevertheless, this is still a difficult task for the learners if they have to memorise each character individually. Fortunately, Chinese characters have another feature: each of them is a unit formed by one or more radicals and components. The number of common and basic radicals is only 70 to 100, and from them more than 70% of all characters can be derived (Fei 1996; Huang, 1996). Obviously, if these 70 to 100 radicals or components are learned first, a large number of characters can be acquired more easily, since most of them are built on those common components. Furthermore, character radicals may also help learners remember or infer the meaning and pronunciation of a character more easily (Dai, 2010). However, each character has its own characteristics, teachers should not merely teach using a method, so the efforts must be done to try and explore, design a variety of teaching activities such as competition, miming and games to guide the learners to learn the word (Zhong, 2004).

Based on the above word studies and investigations, it is suggested that effective vocabulary learning strategies and the general rules of word structure should be taught in Chinese vocabulary pedagogy. The knowledge of common character radicals or components, and a certain amount of 'core' words, i.e. the monosyllabic words and compounds should be taught to learners at the beginning level. For instance, character-decomposition and radical-grouping can be used to help learners memorise basic vocabulary. However, in order to motivate and help pupils better learn and understand Chinese vocabulary, this research further attempts to use vocabulary games to assist on pupils' vocabulary acquisition.

There is a significant body of research supporting the use of games as a valuable teaching method to help learners in vocabulary learning (Chua, 2008; Glynn, Price & Owens, 2005; Kumar & Lightner, 2007; Susie, 2011; Xie, 2000). Past research indicated that games have the potential to draw learners into the learning process and to encourage them to participate through a more interactive environment (Gosen & Washbush, 2004; Proserpio & Gioia, 2007; Zantow, Knowlton & Sharp, 2005). Games, as an educational tool, have the capacity to engage and motivate learners (Paraskeva, Mysirlaki & Papagianni, 2010; Prensky, 2001) and vocabulary learning from games is more likely to be retained (Annetta, Cheng & Holmes, 2010).

As Jong, Shang, Lee and Lee (2010) propose, incorporating games in learning favours constructivist learning. Constructivist learning is parallel with the advocacy of constructivism in education that enables learners to construct knowledge or new ideas on their own (Jong et al., 2010). According to Annetta (2008), in order to create a memory, individuals learn best by doing. So, when educators allow learners a hands-on opportunity it has been proven beneficial. In other words, learners better when they have actually done something with the words they are learning. This is agreeing with what is vital in the constructivist teaching. Therefore, in Chinese vocabulary learning, involving learners in some word tasks such as vocabulary games might be able to help learners to

retrieve and store the words to be learned. This is because when learners engage and favour in games, they can learn better as they have actually done something with the words they are learning in the enjoyable learning environment. In this regard, game-based learning that favours constructivist-based learning will be useful in helping Chinese language teachers to help their learners to learn the language as well as to have a better grasp of vocabulary knowledge. This is an important view to investigate the use of vocabulary games to help learners to learn and retain Chinese vocabulary knowledge in the present study.

Constructivist-based teaching and learning

Constructivist learning theorists (e.g., Papert, 1993; Piaget, 1964, 1970) realised that game-like activities can foster learners' deep learning in which learners are willing to spend more time and effort on learning. For instance, when game is motivating and engaging, even the most disinterested learner is willing to face the challenges created by games to solve problems (Kara, 2010). In comparison to the common strategies used in vocabulary instructions, constructivist-based teaching might prepare teachers to help their learners learn the language. According to this, learning is an active process where the learner takes part of it since s/he builds up new ideas based upon current or past knowledge (Amory & Seagram, 2003).

As Xie (2000) claimed that conventional teaching methods are still having a lot of problems as they rely heavily on dictation and copy written text, and must be improved in order to break through the dilemma of teaching, so as enable children to learn in a pleasant environment. Xie (2000) suggested teachers use games to stimulate children's interests in Chinese vocabulary learning. According to Xie, learning through games not only can foster children's learning, they can promote children's social interaction and active thinking skill.

Game-based learning

Game-based learning is an expansive category, ranging from simple paper-and-pencil games like word searches all the way up to complex, massively multiplayer online and role-playing games. Educational games can be broadly grouped into three categories: non-digital games; digital games that are not collaborative; and collaborative digital games (Johnson, Smith, Levine & Haywood, 2010). Non-digital games include many games already common in classrooms as supplemental learning tools like card games, board games and matching games, whereas, digital games commonly include games designed for computers and online games (Johnson et al., 2010). This research uses non-digital games and employs classroom games like character game, word puzzle, radical components game, card game and matching-pairs game to investigate the effects of games on pupils' vocabulary acquisition in Chinese language classroom.

There have been a number of game-based learning studies focusing on investigating what, why, and how games can make learners more motivated during the process of learning (e.g., Talak-Kiryk, 2010; Nguyen & Khuat, 2003; Uberman, 1998; Wright, Betteridge, & Buckby, 2005). The use of games has been also recognised as being a good tool to promote learners to actively participate in learning activities (Nguyen & Khuat, 2003). Games provide language teachers with many advantages when they are used in classroom (McCallum, 1980). One of these advantages is that learners are motivated to learn the language when they are in a game. (McCallum 1980, p. ix)

emphasizes this point by suggesting that “games automatically stimulate student interest, a properly introduced game can be one of the highest motivating techniques.” In other words, games stimulate students’ interest in classroom activities and as a result, students become motivated and willing to learn.

Another advantage is that the variety and intensity that games offer may lower anxiety (Richard-Amato, 1988) and encourage shyer learners to take part (Uberman, 1998), especially when games are played in small groups. As Wright, Betteridge and Buckby 1984 claims that games provide a context for meaningful communication. Even if the game involves discrete language items, such as a spelling game, meaningful communication takes place as learners seek to understand how to play the game and as they communicate about the game: before, during, and after the game (Wright, Betteridge, & Buckby, 2005).

Similarly, games can also be used as a way to revise and recycle previously taught language. Uberman (1998) stated that the games can be either for practicing specific language items or skills or for more communicative language production. Language games thus allow the use of meaningful and useful language which is used in real contexts and are able to provide a chance for pupils to use the language that they have learnt (Ersoz, 2000).

According to Nguyen and Khuat (2003), learning vocabulary through games is an effective and interesting way that can be applied in any classrooms. As Nguyen and Khuat put it, games bring in relaxation and fun for learners. They tend to learn and retain new vocabulary better when it is applied in a relaxed environment like playing vocabulary games. Games are used not only for mere fun, but more importantly, for the useful practice and review of language lessons. Talak-Kiryk (2010) shares the same view that games have more purpose than creating fun in the classroom. Hence, it is very important in explaining the usefulness and advantages that games can have in a classroom.

Learning Chinese vocabulary through games

When dealing with vocabulary learning, a number of researchers (e.g., Fu, 2005; Luu, 2012; Mansoor & Elham, 2013; Nguyen & Khuat, 2003; Xia, 2011) have revealed that the use of games is an effective method to learn vocabulary. The use of games will help learners to better learn and retain vocabulary and make learning fun and enjoyable. While in learning Chinese vocabulary, Zeng (2006), Lau, Ng and Lee (2011) share the same view that the activity of the vocabulary game not only allows learners to acquire Chinese vocabulary more quickly and efficiently, it makes the Chinese learning classroom atmosphere more pleasure.

When learners learn new vocabulary, Xie (2000) suggests vocabulary games like character-decomposition and radical-grouping games to help learners memorise basic vocabulary. As Xie states, learning through games not only improve children’s word recognition but effectively increase their vocabulary volume. Fu (2005) and Xia (2011) also suggest vocabulary games such as word puzzle and matching pairs to help learners review vocabulary. From their teaching experiences, learners love games, and games have the positive effect of making learners participate actively and can promote vocabulary acquisition.

The fact that games are the most suitable instructional activities for young learners is obvious because they are a natural part of their existence (Yolageldili & Arikan, 2011). Nedomová (2007) states that “young learners are not able to pay attention

for more than 10-20 minutes and after that they start to be bored and tired” (p.17). Moreover, they are imaginative and creative and they learn without being aware of it (Nedomová, 2007). Young learners’ attention is relatively weak, easily distracted, consequently lowering the effectiveness of literacy. Xie (2000) and Hu (2006) both suggest using games in learning Chinese vocabulary. They agree that the introduction of games can enhance learners’ interest to learn, improve learners’ motivation in learning Chinese so that learners are learning in a relaxed and pleasant atmosphere to increase the effectiveness of literacy. Zhong (2004) also has the same view that when a lesson includes a game, the game provokes learners’ interest to focus their learning and to help learners acquire new vocabulary or lexis in an effective way, therefore, the best way to direct this capacity in language learning is using games.

Methodology

This research used quantitative research with quasi-experimental design. A total of 60 year three pupils were randomly selected from a Chinese primary school to investigate the effects of games on pupils’ vocabulary acquisition in Chinese language classroom. The vocabulary acquisition tests were developed as instruments. Teaching programs has been set up for both teachers in the control and the experimental groups. The research instruments used were piloted in a Chinese primary school that was not participated in the study. The experimental group was exposed to games in the learning practices of vocabulary. The control group used the conventional method of learning practices. There were six teaching lessons for the experimental and control groups.

Teaching program and framework

Figure 1 is a general framework of the teaching program used in this study. The lessons were taught in the same way in the experimental and control classes but the learning practices were different. The experimental group used language games while the control group used the conventional method such as doing exercise, drill and practice.

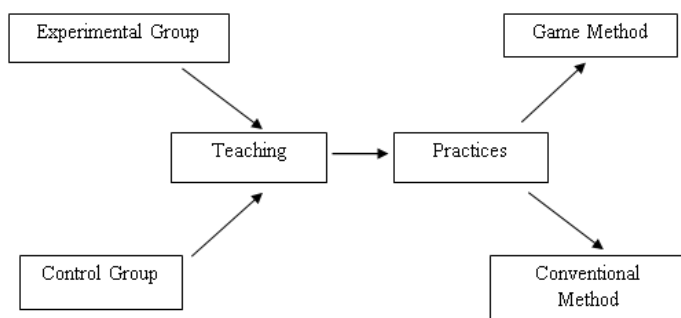


Figure 1 Framework

There were six teaching lessons for the experimental and control groups. The teaching programs were prepared in the Chinese language for experimental group and control group. Table 1 illustrates an example of the teaching program.

Table 1 Example of Teaching Programs for the Experimental and Control Groups

Topic : Mobile Map

Time : 30 minutes

Objectives: Read and understand the meanings of new words in the text.

Materials: Year 3 Chinese language textbook (page 64)

Control group: flash cards of key words and Chinese dictionary

Vocabularies: 幕、系、址、预、测、列、供、移、陌、焦

Experimental group: word search puzzle and the clues (the meanings of the words)

Stages	Time (min)	Experimental group	Control group
Induction set	2	<ol style="list-style-type: none">1. Teacher asks pupils whether they have seen or used GPS.2. Pupils respond and talk about GPS.	<ol style="list-style-type: none">1. Teacher asks pupils whether they have seen or used Global Positioning System (GPS).2. Pupils respond and talk about GPS.
Teaching	10	<ol style="list-style-type: none">1. Teacher reads the text and pupils read after her.2. Teacher asks some questions pertaining to the text.3. Pupils respond to the questions.	<ol style="list-style-type: none">1. Teacher reads the text and pupils read after her.2. Teacher asks some questions pertaining to the text.3. Pupils respond to the questions.
Practice	15	<ol style="list-style-type: none">1. Pupils read and learn the meanings of new words by playing a word search puzzle game.2. Teacher divides pupils in several groups. Each group comprises 6 pupils.3. Pupils work in groups to search 10 words (collocation) found in the text according to the clues given.4. Pupils find and circle the words in the word search puzzle.5. Teacher asks each group leader to show and check their lists in front of the class.6. Each answer scores one point. The group with the most points wins the game.	<ol style="list-style-type: none">1 Teacher shows flash cards of the words accordingly. Pupils read the words.2 Teacher asks pupils to find the meanings of words by using a dictionary.3 Pupils read and learn the meanings of new words using the dictionary.
Closure	3	Teacher asks pupils to read and revise the words done.	Teacher asks pupils to copy the words done in their exercise books.

Vocabulary games used in the experimental group

Pupils in the experimental group used a series of different language games during their learning practices. The following criteria based on the principle for teaching young learners were followed in selecting games (Rosa, 2002).

- the size of the class
- the age of the children
- the language level of the children
- the language structures and functions which are being taught at the time
- the children's interests in and out of the class
- the equipment, materials and time available for preparation
- the noise factor
- the time available for a game

A list of vocabulary games used in this study is presented in Table 2.

Table 2 Vocabulary games used in the study

No	Games	Functions	Vocabulary skills
1	Character Games	Word identification	Identify and recognize new words
2	Word Search Puzzle	Word learning	Recognize and learn new words
3	Matching Pairs Game	Word acquisition	Review and recall vocabulary learned
4	Find Friends Game	Word identification	Identify and learn new vocabulary
5	Word Formation Game	Word recognition	Practice word recognition
6	Memory Game	Word retention	Practice word retention

Implementation of the games

The following is a sample description of one of the games used in the study.

Game 1: Character Game

Function: This game was used for pupils to identify and recognize new vocabulary.

Learning standards: Learn and identify the key words in the text.

Class organization: Pupils were divided in two groups.

Time: 15 minutes

Materials: Flash cards (vocabulary)

Procedures:

1. Divide pupils into two teams. (Keep the teams "fair" by putting pupils of different levels in each team). Remind pupils that it's about team work.

2. Assign each pupil in each team a number 1-10 or more according to how many pupils there are.
3. Each pupil will go against the other pupil with the same number, 1 vs 1, 2 vs 2 etc.
4. Teacher shows all of the words.
5. Teacher will call out different vocabulary and two pupils will come out to choose the word.
6. One point will be awarded to the pupil who is correct and fast.
7. The card that has been chosen each time must be put back.
8. The team with the most points wins the game.
9. If both pupils are correct and finish at the same time then the teacher can just call out a new word to “make up” for that turn.

Data analysis

This research used a quantitative method to examine the effect of vocabulary games on pupils’ vocabulary acquisition in Chinese language classroom. Quantitative data was collected from the respondents through pretest and posttest results. These data were analysed based on the quantitative measurement by using inferential statistics method. The data were calculated and presented in tabular form by using Independent Samples test and One-way ANOVA test.

Research findings

The findings of this study were discussed based on the quantitative data collected from the respondents through vocabulary acquisition tests from pupils of the experimental group and the control group.

Pretest results between the experimental and the control groups

Table 3 shows the results of the *t*-test analysis on pretests between the experimental and control groups. The results showed that the mean score for the experimental group was 47.87 and the mean score for the control group was 55.47 indicating that there was no significant difference between the two groups, $t(58) = 1.34, p > .05$. This implied that the two groups of pupils were the same in terms of vocabulary acquisition.

Table 3 Pretest Results between the Experimental and the Control Groups

	experimental group (<i>n</i> =30)		control group (<i>n</i> =30)		<i>df</i>	<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
pretest	47.87	23.29	55.47	20.41	58	1.34	.184

The mean difference is not significant at 0.05 level

In order to better evaluate the pupils’ performance in Chinese vocabulary acquisition, the pupils were divided into three groups (high, middle and low levels) according to their pretest score in the beginning of the study. One way ANOVA tests were carried out to

compare the inter-group differences among the pupil's performance on pretest scores for the experimental and control groups. As Table 4 indicated, in the experimental group, there was a significant difference in the pretest score for the three level subgroups: $F(2, 27) = 92.22, p < .05$. Similarly, in Table 5 the results also showed that in the control group, there was a significant difference in the pretest score for the three level subgroups: $F(2, 27) = 76.88, p < .05$.

Table 4 One way ANOVA Results for the Subgroups in the Experimental Group on Pretest

Pretest					
	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>Sig</i>
Between Groups	13717.47	2	6858.73	92.22	.000*
Within Groups	2008.00	27	74.37		
Total	15725.47	29			

* $p < .05$

Table 5 One way ANOVA Results for the Subgroups in the Control Group on Pretest

Pretest					
	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>Sig</i>
Between Groups	10273.39	2	5136.70	76.88	.000*
Within Groups	1804.07	27	66.82		
Total	12077.47	29			

* $p < .05$

Although the one way ANOVA showed a statistically significant difference, post-hoc analysis was applied to locate the “source” of significance in the data of the experimental and control groups as shown in Table 6. The results showed in the experimental group that the mean difference between the high level (HL) subgroup and middle level (ML) subgroup was statistically significantly different at the $p < .05$ level. The mean difference between the high level (HL) subgroup and low level (LL) subgroups was statistically significantly different; and the mean difference between ML subgroup and LL subgroup was also statistically significantly different. Similarly, in the control group, Table 1.5 indicated that the pupils from different vocabulary levels performed differently.

Table 6 Post-Hoc Test Results between the Experimental and the Control Groups on Pretest

(A) subgroups	(B) subgroups	experimental group (n=30)			control group (n=30)		
		MD (A-B)	Std Error	p	MD (A-B)	Std Error	p
HL	ML	21.50	4.45	.000*	19.69	3.88	.000*
	LL	53.50	4.21	.000*	54.48	4.55	.000*
ML	HL	-21.50	4.45	.000*	-19.69	3.88	.000*
	LL	32.00	3.57	.000*	34.79	3.67	.000*
LL	HL	-53.50	4.21	.000*	-54.48	4.55	.000*
	ML	-32.00	3.57	.000*	-34.79	3.67	.000*

* $p < .05$

Finally, a t-test was also conducted to compare the differences for each level between the experimental group and the control group. In Table 7, for each level, there was no statistically significant difference between the experimental group and the control group with regards to the vocabulary acquisition before the start of the study.

Table 7 The t-test Results for the Subgroups between the Experimental and the Control Groups on Pretest

Subgroup	Pretest						df	t	p
	experimental group (n=30)			control group (n=30)					
	n	M	SD	n	M	SD			
ALL	30	47.87	23.29	30	55.47	20.41	58	1.34	.184
HL	6	80.00	7.29	6	79.33	5.96	10	-0.17	.433
ML	10	58.50	8.90	17	59.65	9.16	25	0.32	.377
LL	14	26.50	8.90	7	24.86	6.89	19	-0.43	.337

The mean difference is not significant at 0.05 level.

Posttest results between the experimental and the control groups

In order to find out if teaching vocabulary using game-based practice made any significant differences during the six weeks of intervention, the posttest scores were collected from both the experimental and the control groups.

a. Posttest results (Research question 1 and hypothesis 1)

The posttest results in Table 8 showed that there was no statistically significant difference between the two groups, $t(58) = -0.90$, $p = .186$. However, the experimental group ($M = 82.27$, $SD = 18.55$) had a higher mean score than the control group ($M = 78.17$, $SD = 16.63$). This findings indicated that the experimental group performed better than the control group ($MD = 3.0$) although it was not statistically significant.

Table 8 Posttest Results between the Experimental and the Control Groups

	experimental group (n=30)		control group (n=30)		df	t	p
	M	SD	M	SD			
posttest	82.27	18.55	78.17	16.63	58	-0.90	.186

The mean difference is not significant at 0.05 level.

It is notable that before the intervention, the mean score on pretest of the experimental group ($M = 47.87$, $SD = 23.29$) was lower than that of the control group ($M = 55.47$, $SD = 20.41$). The pretest mean score showed that the control group performed better than the experimental group ($MD = 7.60$). But after the intervention, the result indicated a progress in the experimental group that showed the experimental group ($M = 82.27$, $SD = 18.55$) performed better than the control group ($M = 78.17$, $SD = 16.63$) with a mean difference score of 3.0. Close examination of the graph in Figure 2 revealed that the pupils in the experimental group performed better than the control group in terms of vocabulary acquisition when game-based practice was used in the classroom although it was not statistically significant.

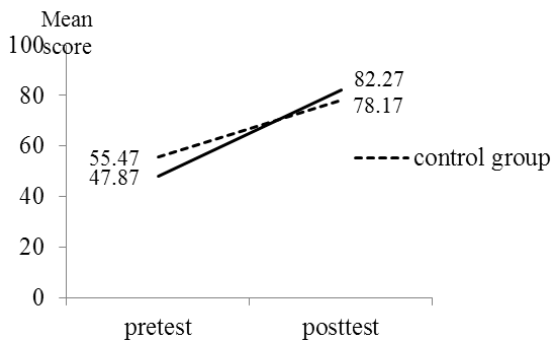


Figure 2 Comparison of mean scores for experimental and control groups on pretest and posttest.

b. Posttest results (Research question 2 and hypothesis 2)

In order to answer the second hypothesis that pupils of high, middle and low vocabulary levels in the experimental group would perform better than pupils of high, middle and low vocabulary levels in the control group on the vocabulary acquisition tests; the pupils were also divided into 3 levels to evaluate their performance in vocabulary acquisition on posttest.

One way ANOVA was carried out to compare the differences among the subgroups' performance on posttest scores for the experimental group. As Table 9 indicated, in the experimental group, there was a significant difference in the posttest score for the three level subgroups: $F(2, 27) = 9.02, p < .05$. That means that the three levels had remained the same after the posttest.

Table 9 One way ANOVA Results for the Subgroups in the Experimental Group on Posttest

	Posttest				
	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>Sig</i>
Between Groups	3995.01	2	1997.54	9.02	.001*
Within Groups	5980.79	27	221.51		
Total	9975.87	29			

* $p < .05$

Similarly, Table 10 indicated, in the control group, there was a significant difference in the posttest score for the three level subgroups: $F(2, 27) = 9.02, p < .05$. In summary, the pupils of the same level in both the experimental and control groups had statistically significant difference in the performance. This means that for both the experimental and control groups; they remained as they were before the study.

Table 10 One way ANOVA results for the subgroups in the control group on posttest

	Posttest				
	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>Sig</i>
Between Groups	5526.40	2	2763.20	29.97	.000*
Within Groups	2489.77	27	92.21		
Total	8016.17	29			

* $p < .05$

Post-hoc analysis was also applied after the study as shown in Table 11. The results showed in the experimental group that the mean difference between the high level (HL) subgroup and the low level (LL) subgroup was statistically significantly different at the $p < .05$ level (similar to the results as shown in Table 6). The mean difference between the middle level (ML) subgroup and low level (LL) subgroup was also statistically significantly different (similar to the results as shown in Table 6). However, what was surprising was that the mean difference between HL subgroup and ML subgroup was no statistically different; indicating that the middle level pupils could have grew at their own pace, made improvement and performed a well as the high level pupils.

On the other hand, in the control group, the mean difference between the high level (HL) subgroup and middle level (ML) subgroup was statistically significantly different at the $p < .05$ level. The mean difference between HL subgroup and low level (LL) subgroups was statistically significantly different; and the mean difference between ML subgroup and LL subgroup was also statistically significantly different.

In summary, Table 11 indicated the pupils in middle level subgroup in the experimental group showed an encouraging progress and made improvement to perform as well as the high level subgroup of pupils in terms of vocabulary acquisition. This could indicate that game-based practice benefited the middle level subgroup.

Table 11 Post-Hoc Test Results between the Experimental and the Control Groups on Posttest

(A) subgroups	(B) subgroups	experimental group (n=30)			control group (n=30)		
		MD (A-B)	Std Error	<i>p</i>	MD (A-B)	Std Error	<i>P</i>
HL	ML	6.97	7.69	.641	11.88	4.56	.038*
	LL	26.96	7.26	.003*	39.00	5.34	.000*
ML	HL	-6.97	7.69	.641	-11.88	4.56	.038*
	LL	19.99	6.16	.009*	27.12	4.31	.000*
LL	HL	-26.96	7.26	.003*	-39.00	5.34	.000*
	ML	-19.99	6.16	.009*	-27.12	4.31	.000*

* $p < .05$

Finally, a t-test was conducted to determine whether the different vocabulary acquisition practices had effects on the subgroups differently. The results in Table 12 showed that there was no statistically significant difference between the two groups $t(58) = -0.90$, $p = .186$. However, the posttest score for HL subgroups between the experimental group ($M = 97.17$, $SD = 3.31$) and the control group ($M = 94.00$, $SD = 2.61$) was statistically different, $t(10) = -1.84$, $p = .048$. Similarly, the posttest score for ML subgroups between the experimental group ($M = 90.20$, $SD = 4.85$) and the control group ($M = 82.12$, $SD = 10.86$) was also statistically different, $t(25) = -2.21$, $p = .018$. Likewise, the posttest score for LL subgroups between the experimental group ($M = 70.21$, $SD = 20.97$) and the control group ($M = 55.00$, $SD = 9.75$) was statistically different $t(19) = -1.81$, $p = .044$. For each level, there was statistically significant difference between the experimental group and the control group. The ANOVA results in Table 13 revealed that

the mean difference among the three vocabulary acquisition levels in both groups reached a statistically significant difference ($p = .000$).

Table 12 T-test results for the subgroups between the experimental and the control groups on posttest

Subgroup	Posttest								
	experimental group ($n=30$)			control group ($n=30$)			df	t	p
	n	M	SD	n	M	SD			
ALL	30	82.27	18.55	30	78.17	16.63	58	-0.90	.186
HL	6	97.17	3.31	6	94.00	2.61	10	-1.84	.048*
ML	10	90.20	4.85	17	82.12	10.86	25	-2.21	.018*
LL	14	70.21	20.97	7	55.00	9.75	19	-1.81	.044*

* $p < .05$

Table 13 One way ANOVA Results among the Subgroups in Both Groups on Posttest

	Posttest				
	Sum of Squares	df	Mean Square	F	Sig
Between Groups	8252.03	2	4126.01	23.54	.000*
Within Groups	9992.16	57	175.30		
Total	18244.183	59			

* $p < .05$

The second hypothesis stated that the pupils of high, middle and low vocabulary levels in the experimental group who were taught using game-based practice would perform better in the vocabulary acquisition as compared to pupils of high, middle and low vocabulary levels in the control group who were taught using conventional practice. The results indicated that the experimental group of pupils in the high level, middle level and low level performed better than the control group of pupils of equivalent level. There was statistically significant difference between the experimental sub-groups and the control sub-groups. Therefore, the second hypothesis was supported by the results.

Discussion

The findings of the use of game-based practice with the experimental group of pupils during vocabulary practice did not result significant difference between the two groups

as shown in the vocabulary acquisition test. However, the experimental group of pupils obtained a higher vocabulary acquisition (higher mean score) than the control group of pupils, indicating some positive advantages as a result of using games. It also revealed that the pupils of high, middle and low vocabulary levels who were taught using game-based practice in the experimental group had a significant improvement in vocabulary acquisition than the pupils who were taught using conventional practice in the control group. It also emerged that the pupils of middle vocabulary level in the experimental group showed greater improvements as well as the high vocabulary level (Table 1.10).

The main result on the use of games during vocabulary practice with the experimental group was disappointing, the failure, however, to obtain a significant difference required some interpretation. First, the introduction of games which was different to what the pupils were experiencing, and most probably too from the way all other subjects in the pupils' curriculum were taught, was a rather big change for most pupils. Games also required the pupils to be active in class, thus creating a rather new experience for them. Probably, the pupils were more accustomed to the teacher-centered lessons.

Second, the use of games could run against a deeply popular pedagogical approach which could have proven too 'alien' to the pupils and for them to benefit from the short period of the experiment. Often, in Chinese conventional classrooms, pupils were used to the conventional teaching practices with a lot of exercises such as drills and practice to help pupils master the vocabulary. The game-based practice might have transformed a conventional class into a challenging one. Game-based practice was different from the pupils' normal way of learning and also different from how other subjects were taught. Hence, the pupils were not used to the changed method which required them to use more vocabulary than they were used to. In game-based practice, pupils were generally competitive as they want to have a turn to play, to score points and to win. However, for the quiet or shy pupils, such pedagogical approach might make it hard for them to switch their learning styles.

Third, the size of the experimental class was relatively large to allow the appropriately use of games in groups. The size of 30 pupils probably did not allow enough practice time to allow a substantial change to occur in pupils' vocabulary acquisition as compared to the control group. According to Blatchford, Bassett, Brown, Martin and Russell, (2007), class size could affect the quality and effectiveness of learning. Usually, there was less individual attention in larger class (Blatchford et al., 2007). Furthermore, the teacher in the experimental class had to keep up with the tight class schedule which had to be the same as those of the control group. Although the experimental group of pupils enjoyed the use of games, it was not necessarily translated into a higher level of vocabulary acquisition because of the relatively high number of pupils in the class.

It is important to note that, in spite of the interpretation given, it will never fully explain the failure to achieve a statistically significant outcome in favour of games. It is to be acknowledged that the real impact of games in the teaching and learning in a Chinese language class needs to be further explored, in order to either confirm its limited value or to indicate a greater degree of usefulness that this research has provided.

On a positive note, the second hypothesis was supported by the result. The results regarding the level of vocabulary acquisition in the vocabulary acquisition test showed that there was statistically significant difference between the experimental group and the control group (Table 1.11). This result is very encouraging as it shows that the use of games is more beneficial to pupils with generally lower academic ability, as

suggested by Ke (2008). This result also empirically supports Ke, (2008) who showed that weaker pupils will benefit from the use of games. The positive outcome is very encouraging and it can be cautiously suggested that a causal relationship between the improvement of lower achieving pupils and the use of games in the practice phase of vocabulary acquisition.

Conclusion

The evidence in the findings shows that game-based practice is an effective teaching practice that should be adopted in the Chinese language classroom. Although exercises and drill or practice can help pupils retain vocabulary to some extent, it will be more effective if teachers add more games in class to motivate pupils in learning vocabulary. In fact, games create a fun learning environment, add motivation, and promote team learning and collaborative skills (Luu, 2012). Being motivated by the relaxed and fun atmosphere, pupils are willing to take part in the learning process in a subconscious manner.

Chinese language teachers should recognise that games are also a form of learning. In spite of the heavy schedule and time constrain, teachers should sometimes let their pupils relax with games so as to energise their mind and to encourage them to study better. Games, in fact, are not games only; it is not a waste of time, but a good means of education (Lee, 1995). By playing games, pupils can review or practice their language that they have just studied in a relax mood. Therefore, games used should be considered as central to instructional planning as children tend to acquire vocabulary knowledge through playing.

Previous research findings have revealed that language games used in the classroom are very effective and supportive activities in contributing to learners' language skills and proficiency, as this research also showed. They offer numerous advantages to language learners. Unfortunately, because of limitations of time and curriculum, teachers normally have to cover all the content and materials, and it is not always easy to incorporate games into the class. Also, sometimes it is difficult to find the appropriate game due to learners' different learning styles and preferences, and the nature of games themselves. However, it is still worth trying to use them in class.

Nevertheless, it can be seen that games are very useful and can be used to improve pupils' language learning Chinese language teaching can be enriched so that primary school pupils enjoy learning Chinese. Therefore, it is suggested that primary school Chinese language teachers try some games that might be useful to their pupils in order to enhance pupils' language abilities and at least to try new things in teaching. With accurate planning and information passed onto the teachers, this problem should be dealt with to secure the benefits of games in the Chinese language classroom.

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