The Effect of Play-Based Instruction on Young Learners' English Vocabulary Learning: A Case Study of Primary School Students in Guangxi Zhuang Autonomous Region

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Abstracts

The objectives of this research were: (1) To compare the effects of play-based instruction and rote instruction on pupils' English vocabulary learning in classroom setting. (2) To examine the levels of pupils' positive engagement during play-based instruction classes. This research involved 22 pupils studying in Grade 4 divided into a control group and an experimental group. The research instruments employed in this research were play-based instruction, pretest, post-test, and an observation checklist. The data of pretest and post-test were analyzed by independent samples t-test, paired samples test, mean (M), and standard deviation (SD). Pupils' sum and frequency, whose data originated from the observation checklist were measured pupils' positive engagement, negative engagement, and non-engagement levels.

The results were: (1) Play-based instruction was more effective than rote instruction on learning vocabulary. (2) In play-based instruction, the level of pupils' positive engagement was high.

Keywords: Play-based Instruction; Vocabulary; Young Learners; Rote Instruction

Introduction

English has gradually become a compulsory subject across Chinese primary schools since 2001. Primary school stage is a golden period for pupils to acquire English vocabulary efficiently to a large extent (Jiang, 2017 : 41). Nevertheless, the educational resources gap between the east and the west of China is extreme large, not to mention rural areas. Due to the lack of qualified and experienced English teachers in Chinese western rural primary schools, most current English teachers use traditional methods to teach vocabulary. Pupils learn vocabulary mainly by rote. In view of this situation, another more appropriate instructional method should be adopted to improve pupils' vocabulary learning.

Play-based instruction is a teaching method to achieve educational goals by means of games in an educational environment. It integrates game activities with teaching activities, so that learners can master scientific knowledge in a lively atmosphere even in the fierce competition imperceptibly. Play-based instruction can promote the development of English education in rural primary schools and improve the enjoyment and efficiency of learning vocabulary in a happy atmosphere for pupils (Yan, 2014: online; Ding, 2020 : 1). It is an instruction by which pupils participate in sensible activities and acquire knowledge incidentally. Furthermore, play-based instruction conforms to the teaching approach for pupils, and it is feasible to be applied to phonetic, vocabulary, and grammar teaching (Liu, 2018 : 67). Given these benefits, this study is intended to explore the effect of play-based instruction on

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pupils' English vocabulary learning and their engagement in the classroom.

Research Objectives

Under the background of exam-oriented education and the limitation of teaching conditions in rural areas, most teachers in rural primary schools employ some rigid and coercive teaching approaches, leading to the fact that the utilization rate of games in rural primary schools is extremely low (Jia & Sui, 2021 : 95-96) and students' engagement is low (Wu, 2021 : 178-179). Therefore, this study aims to:

1. Compare the effects of play-based instruction and rote instruction on pupils' English vocabulary learning in classroom setting.

2. Examine the levels of pupils' positive engagement during play-based instruction classes.

Research Methodology

1. Participants

There were 22 who attended the study in LM Primary School. Their ages were 10-11. All of them began to learn English from 3rd grade and never received any play-based instruction before. On their routine vocabulary class, they studied English vocabulary by means of reading after teacher and rote learning.

2. Research Instruments

Instruments employed in this study included play-based instruction, pretest, post-test, and observation checklist.

2.1 Play-based instruction

Play-based instruction of each class was made up of three sections: direct instruction, teacher-guided game, and children-guided games. In the first section, direct instruction which lasted about ten minutes, children sat in a circle. They passively and mechanically accepted vocabulary learning through sight, hearing, and mouth. It was by reproductive assimilation and phonetic accommodation that pupils learned vocabulary. In the second section, teacher-guided game was a transition from teacher-centered to child-centered. It was a process when teacher organized and assisted children in participating in games for about ten minutes. In the third section, children-guided games, took about twenty minutes. Teacher provided pupils with some game materials and guides their engagement, forming a "prepared environment". Pupils were free to move in the classroom and choose what game to played, when to stop and tried other games. They could play on their own, in pairs or in groups without close adult oversight or control.

The games and materials of play-based instruction class were selected from *Useful primary and secondary school English teaching games* written by Amina Dyussenova and Wang Xiaoqing (2020:7). Amina Dyussenova has lived in 4 countries and has more than 15 years of teaching experience, including 11 years in China. One teacher-guided game was played in the second section of each class. Four teacher-guided games in four classes were: rase to erase, kaboom, flyswatter, and capture the tails. Every class contained the following four children-guided games in the third section: fishing with magnets, memory, crossword, and hedbanz.

2.2 Pretest and post-test

The second instrument was test. Test included a pretest and a post-test. The purpose of pretest was to collect the data of effect after both groups received rote instruction on the first half semester. The post-test was used to find the answers of the first research question. Pretests and post-tests were paralleled. There were 33 words and 3 phrases chosen from textbook in each test, which avoided disrupting the normal teaching schedule. If the vocabulary in pretest and posttest were out of the textbook, it would increase the participants' extra study burden. Only content words were selected because functional words were too abstract for children to express and describe the meaning. Pupils needed to pronounce the words correctly and said their Chinese meanings. IOC values (Item-Objective Congruence) of pretest and post-test evaluated by four experts were respectively 1 and 0.5. The pre-test and post-test had a high level of reliability (Cronbach's α= 0.974).

2.3 Observation Checklist

The third instrument was observation checklist. Based on the categories of engagement which covered children's behavior, cognition, and emotion (Fredricks et al., 2004: 59-109), an observation checklist (Table 1) of children-directed play was created by the researcher. It was made up of twenty items of 5-likert scale. Items 1, 2, 3, 8, 10-17, were behavioral engagement. Items 5, 6, 9, 18, 19 were cognitive engagement. Item 4 was related to both behavioral and cognitive engagement. Affective engagement contained item 7 and 20. Besides, observers can supplement some extra items. Extra items 21, 22, 23 were behavioral engagement. Mean of six experts' evaluation of each item of observation checklist ranged from 0.5 to 1. The observation checklist's Cohen's kappa had statistical significance (Cohen's kappa= 0.729, P<0.001).

Note: This observation checklist is used to rate the last twenty minutes of each video record. Please confirm which time sample duration is observed. Be sure to rate all the items at the end of each 2-minute period. If observers observe some situation which is related to children's engagement or non-engagement but not listed on this sheet, observers are allowed to add some additional item descriptions.

Never = No occurrence — behavioral

Seldom = Occurrence less than 15 seconds

Sometimes = Occurrence within 15 - 40 seconds — cognitive

Often = Occurrence within 40 - 80 seconds

Always = Occurrence within 80 - 120 seconds — affective

Observation Date		Student's Name	
Time	From ( ) minute to ( ) minute		

Items Descriptions	**Never**	**Seldom**	**Sometimes**	**Often**	**Always**
1.Operate or use game materials correctly.					
2.Offer help to peers or receive teacher and peers' help.					

3.Celebrate a victory.					
4.Call for teacher of peers' help. (beh,+cog.)					
5.Pay attention on playing games.					
6.Follow the rules of games and read the words.					
7. Emotions generated as the related engagement in game activities.					
(Supplement by observers)					
8.Isolate self from others.					
9.Impatience.					
10.Gossip.					
11.Make odd noises.					
12.Disturb other children deliberately.					
13.Abuse or destroy the game materials not for the purpose of learning.					
14.Disobedient.					
15.Physical fights.					
16.Want to quit game activities.					
17.Leave the classroom.					
18.Daydream or get lost in thought.					
19. Distraction.					
20.Emotions generated as the non-engagement in game activities.					
(Supplement by observers) 21.Game transfer.					
22.Loitering.					
23.Bystander.					

Table 1 Observation Checklist

3. Data collection

22 4th grade pupils of LM primary school attended the study. They were divided into a control group with 12 pupils and an experimental group including 10 pupils. The control group received rote instruction by their English teacher as usual, but the experimental group received play-based instruction by the researcher. The learning content of both groups was the same set of the vocabulary of the last four units on textbook. Two cameras recorded the instruction procedure of experimental group. After the play-instruction was completed, both groups received the post-test.

Two observers were invited to watch the video clips of ten minutes' child-guided games in each class independently by using computer. Observers were allowed to watch the video clips repeatedly but were not allowed to communicate with each other. Only one pupil was focused on each time. Observers filled in the observation checklist every two minutes of video time progress bar. It means each observer assessed the video clips and completed the 5-likert observation checklist of 23 items 5 times for each pupil. Both observers reached an agreement that items 21, 22, and 23 were added in the original observation checklist for the observation checklist used for the main study.

4. Data analysis

The data of pretest and post-test of both groups was collected and calculated using SPSS. Independent samples t-test and paired samples test were used to determine whether there was statistical evidence that both groups were significantly different. Mean (M) and standard deviation (SD) of both groups' pretest and post-test were adopted to analyze the effects of play-based instruction and rote instruction. Pupils' sum and frequency were measured their positive engagement, negative engagement, and non-engagement levels.

Research Framework

Piaget (as cited in Horn & Kincheloe, 2006: 194) claimed that assimilation and accommodation both work as part of learning process. Generally speaking, assimilation is the process of absorbing new information to adapt one's existing understanding of the world. The existing beliefs do not alter. Accommodation is the process of adjustment of existing cognitive structure to suit new environment. The original ideas are changed or even replaced based on new information. Piaget believed when children learn, they strike a balance between assimilation and accommodation (equilibration). They are two complementary, interactive and constantly changing learning processes of development. Piaget insisted that assimilation is dominant in play. He identified play as "pure assimilation" (Henricks, 2014: 190-213). In contrast, when accommodation is dominant, children deploy imitation activity. Both assimilation and accommodation are used to learn language.

Vygotsky, (1978, 6-18) advocated play-based learning and supported an extension of applicable population to late childhood. He affirmed the significance of the Zone of Proximal Development (ZPD) where children develop their new behavior and create new knowledge and problem solutions by their existing knowledge and experience. Children are guided close towards ZPD via interaction with teachers and peers while participating in play-based learning activities.

Another educator Montessori, (1967: 180) once said: "Play is the work of the child." Montessori is a pioneer in the field of learning materials. Her materials are also designed child-sized to carry out available and purposeful activities (Lillard, 2008: 20-25). In Montessori classrooms, children can not only choose what materials they are interested in and what activities they like, but also do what is right and beneficial. If children can choose what they want, they will have a sense of control over their play.

Play is often deemed as child-led and it is the child who shows all the power (Eberle, 2014: 214-233). Zosh et al. (2017: 13) presented playful learning as a continuum which includes free play, guided play and games based on balance of child-adult involvement and constraints. Afterwards, Zosh et al. (2018: 1124) developed the continuum into a spectrum. As the same to the continuum, free play is at one end of the spectrum. Pyle and Danniels,

(2017: 274-289) proposed a continuum of play-based learning which stresses how child directed play and teacher directed play can be employed. Play-based learning is proposed as a continuum which ranges from free play to teacher-guided play by Early Learning Coaching Team of The University of New Hampshire (UNH). Comparing four continua above, it can be found that free play and games are emphasized. Free play is praised as the gold standard of play (Romano et al. 2010, 995-1007). As observed by Pyle and Danniels, free play was the dominant type of play, and 60% episodes of play observation were free play (Pyle & Danniels, 2017: 274-289). Games have inflexible rules and specific goals. It was observed by Pyle and Danniels, (2017: 274-289) to be implemented in all nine classrooms to promote language skills. Vocabulary games introduce various context of real world into classroom. Pupils who have learned and practiced new vocabulary through games have chances to use language in a stress free way (Uberman, 1998: 20-27). Game is the highest stage of play emerging in pupils between the ages 7-12. Pupils can follow the rules when playing. Hence, games will be employed in play-based instruction in this study. They constitute an important part of the framework in this study (Figure 1).

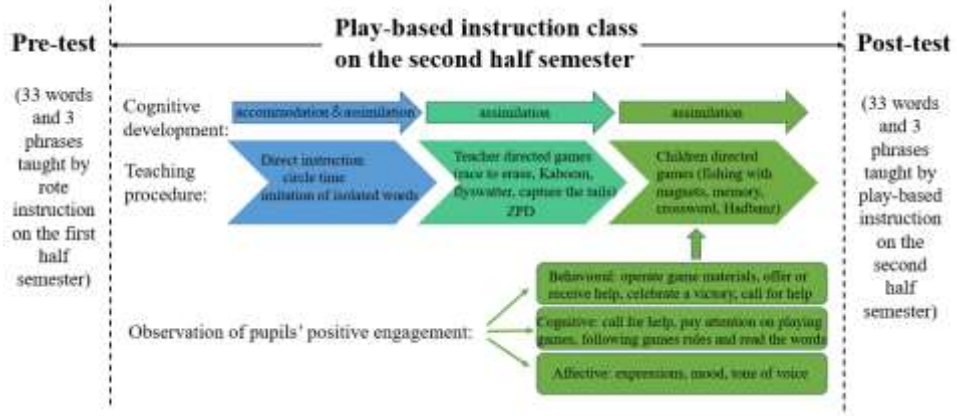

Figure 1 The research framework of this study

Engagement is one's implication of involvement, focus, and persistence on task in learning (Carini et al., 2006: 1-32). Engagement is the degree of pupils' participation in playing games at specific time. It can be measured by positive engagement, negative engagement, and non-engagement. Positive engagement means participants take initiative to be concentrated on playing games according to game rules with high enthusiasm spontaneously. Negative engagement means what participants do has undesirable, disruptive impact on other peers or breaks game materials, game rules, and classroom disciplines deliberately. Non-engagement means participants invest no time or effort on playing games with an indifferent attitude. To examine the levels of pupils' positive engagement was the second research objective of this study. The observable behaviors of positive engagement included operate games materials correctly, offer or receive help, celebrate a victory, and call for help. These actions pupils took during playing games supported, promoted learning, and had a positive significance for learning. Positive cognitive engagement items tended to include call for help, pay attention on playing games, follow the rules of games and read the words. Cognitive engagement reflected the extent of pupils' mental thinking, decision making, attending, and focusing on playing games. While positive affective engagement dealt with pupils' active emotional responses to playing games. It was measured by pupils' interest, curiosity, enthusiasm towards specific games. Directly, it was observed by pupils' expressions, mood, and tone of voice.

Research Results

1. The effectiveness of play-based learning

Tables 2 showed that homogeneity of both groups was met (P>0.05 in Levene's Test) at pre-test, which verified there was no difference (P>0.05 in t-test for Equality of Means) between both groups before the main study.

Group	Levene's Test for Equality of Variances	T-test for Equality of Means
	Sig.	Sig. (2-tailed)
Control group	.696	.766
Experimental group	.958	.772

Table 2 Both groups' pretest statistics of independent samples test

Moreover, the data of paired samples correlations (Table 3) revealed that there were significant correlations between both groups' pretest and post-test scores (r>0.8, P<0.05). It verified the consistency of the paired data. This meant that individuals who had low scores before rote instruction and play-based instruction still had a low rank after rote instruction and play-based instruction. Those who had high scores before rote instruction and play-based instruction still had a top rank after rote instruction and play-based instruction. Paired scores of pretest and post-test were associated, which showed the stability of rote instruction and play-based instruction. On the contrary, if those who had low scores before rote instruction and play-based instruction had a top rank after rote instruction and play-based instruction or those who had high scores before rote instruction and play-based instruction had a low rank after rote instruction and play-based instruction, it reflected that rote instruction and play-based instruction were unstable.

		N	Correlation	Sig.
Pair 1	Pre-test & post-test English pronunciation in experimental group	10	.944	.000
Pair 2	Pre-test & post-test Chinese meaning in experimental group	10	.914	.000
Pair 3	Pre-test & post-test English pronunciation in control group	12	.927	.000
Pair 4	Pre-test & post-test Chinese meaning in control group	12	.855	.000

Table 3 Both groups' statistics of paired samples correlations

In addition, Table 4 indicated that the difference scores of pretest and post-test were normally distributed (P>0.05). The total size used in this study was the total degrees of freedom (N=df). Pupils' scores of the experimental group are significantly different (P<0.05) after receiving play-based instruction while those of control group had no significant differences (P>0.05) with rote instruction (Table 5).

	Group	Shapiro-Wilk	
		df	Sig.
Difference of English pronunciation	Control group	12	.686
	Experimental group	10	.799
Difference of Chinese meaning	Control group	12	.196
	Experimental group	10	.213

Table 4 Test of normality of both groups' pretest and post-test

		Sig. (2-tailed)
Pair 1	Experimental group pre-test English pronunciation – Experimental group post-test English pronunciation	.002
Pair 2	Experimental group pre-test Chinese meaning – Experimental group post-test Chinese meaning	.002
Pair 3	Control group pre-test English pronunciation – Control group post-test English pronunciation	.470
Pair 4	Control group pre-test Chinese meaning – Control group post-test Chinese meaning	.715

Table 5 Both groups' statistics of paired samples test

			Mean	Std. Deviation
Experimental group (N=10)	Pretest	English pronunciation	28.90	5.801
		Chinese meaning	32.10	4.202
	Posttest	English pronunciation	29.80	5.350
		Chinese meaning	32.90	4.383
Control group (N=12)	Pretest	English pronunciation	29.67	6.050
		Chinese meaning	29.17	5.114
	Posttest	English pronunciation	30.42	4.522
		Chinese meaning	30.75	5.864

Table 6 Results of both groups' pretest and post-test

Table 6 presents both groups of pupils' results in pretest and post-test. At pretest, experimental group pupils' English pronunciation mean value was 28.90 (SD=5.801) and their Chinese meaning mean value was 29.80 (SD=5.350). Mean value of control group pupils' English pronunciation and Chinese meaning was respectively 29.67 (SD=6.050) and 30.42(SD=4.522). At post-test, English pronunciation mean value of experimental group pupils was 32.10 (SD=4.202) and their Chinese meaning mean value was 32.90 (SD=4.383). In control group, pupils' English pronunciation mean value was 29.17 (SD=5.114) and their Chinese meaning mean value was 30.75 (SD=5.864).

Compare data of experimental group, the same pupils in experimental group, the means of both English pronunciation and Chinese meaning in posttest was greater than those in pretest. As far as data of control group was concerned, means of control group's English pronunciation and Chinese meaning both in pretest and posttest had subtle changes. Even the English pronunciation mean value of posttest in control group was less than that of pretest in control group. Regarding homogeneous pupils' posttest values in both groups, the means of both English pronunciation and Chinese meaning in experimental group were more than those in control group. It was obvious that pupils in experimental group outperformed those in control group.

2. Pupils' positive engagement, negative engagement, and non-engagement

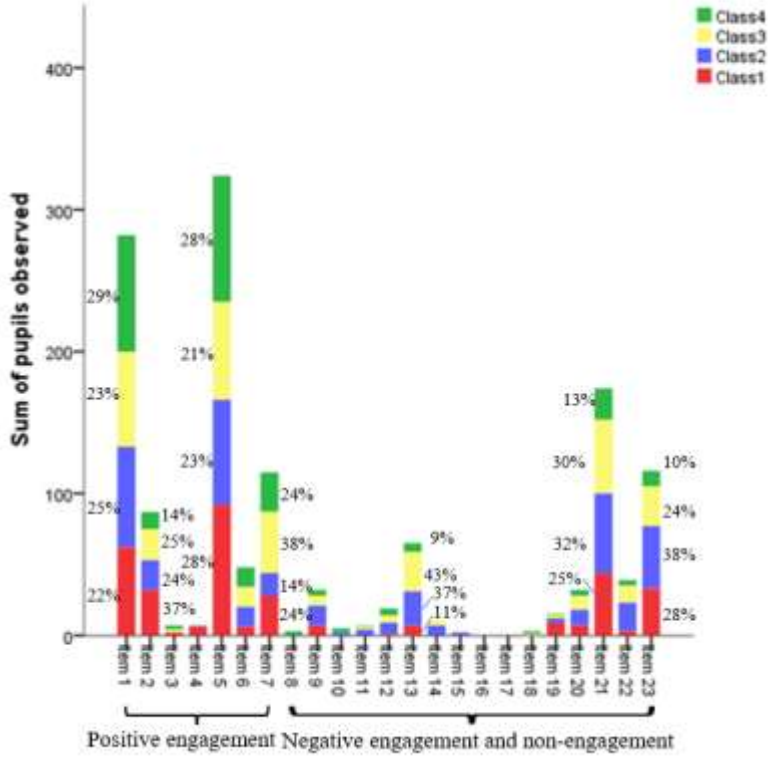

Figure 2 The observation results of pupils' positive engagement, negative engagement and non-engagement sum in each class

Figure 2 presented the sum of pupils' engagement under observation in all four classes and figure 3 showed the frequency of observed behavior item. In general, pupils' positive engagement (items 1-7) was superior to pupils' negative engagement and non-engagement

(items 8-23) from the perspectives of pupils' sum observed and frequency observed of each item. The former was more than twice as many as the latter. The top items of positive engagement observed were: (1) Item 5 Pay attention to playing games. (2) Item 1 Operate or use game materials correctly. (3) Item 7 Emotions generated as the related engagement in game activities. (4) Item 2 Offer help to peers or receive teacher and peers' help. (5) Item 6 Follow the rules of games and read the words. The items with the lowest number observed were Item 3 Celebrate a victory and Item 4 Call for teacher's or peers' help. On the other hand, the top items of negative engagement and non-engagement observed are: (1) Item 21 Game transfer. (2) Item 23 Bystander. (3) Item 13 Abuse or destroy the game materials not for the purpose of learning. (4) Item 22 Loitering. (5) Item 20 Emotions generated as the non-engagement in game activities. Meanwhile, Item16 Want to quit game activities and Item 17 Leave the classroom were not found in all video clips of four classes.

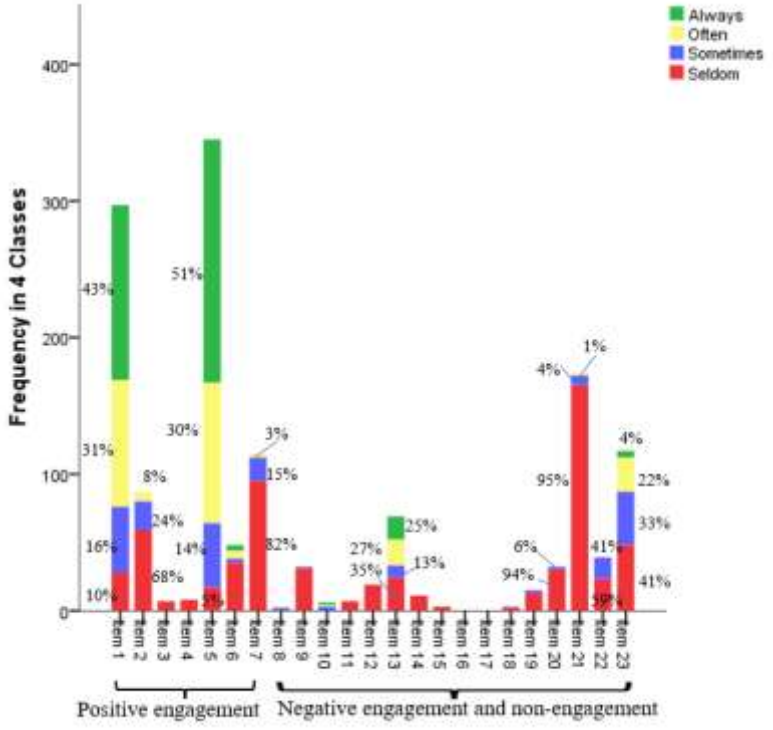

Figure 3 The observation results of frequency of positive engagement, negative engagement, and non-engagement items

According to figure 3, pupils' behaviors of being concentrated on playing games and operating game materials were captured the most and lasted for a long time. Secondly, many pupils were observed to have a high frequency of transferring game from one to another. But the time it took in transferring was short. Then, a certain number of pupils acted as bystanders for a relatively short time. They stood aside and watched peers play game without any participation. Besides, some positive expressions, such as grin, smirk, giggle, excitement, and wild with joy, were caught wearing on face for seconds (Item 7). In addition, it was found that some pupils used game materials not for the purpose of playing. Even several pupils abused the game materials (Item 13).

Alternatively, want to quit game activities (Item16) and leave the classroom (Item 17) were not observed in four classes. Physical fight (Item 15) was the least behavior observed for a few brief seconds. It was followed by daydream of getting lost in thought (Item 18). Three pupils were noticed doing nothing with grazed eyes in the third and fourth classes. Isolate oneself from others (Item 8) was ranked at the third place. One minute before the end of the fourth class, three girls moved to a corner, sitting, and waiting. Next, three girls had the behavior of gossip twice about one minute or longer (Item10). Lastly, celebration of a victory (Item 3) and making odd noises (Item 11) were observed each seven times. The duration kept less than 10 seconds.

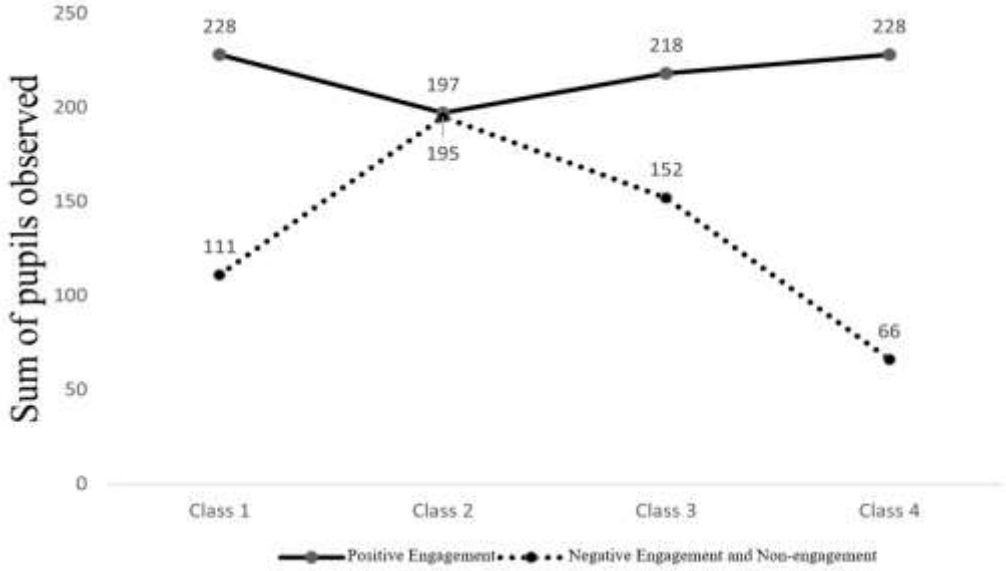

Figure 4 Pupils' sum of positive engagement, negative engagement and non-engagement

Figure 4 revealed that pupils' sum of positive engagement level was higher than that of negative engagement and non-engagement. They varied in an opposite way. The numbers were very closed in the second class. Subsequently, pupils' positive engagement had a gentle upward tendency while their negative engagement and non-engagement had a sharp downward trend.

Figure 5 presented that frequency of negative engagement and non-engagement tended to rise rapidly and then fell dramatically. Pupils' seldom scale of negative engagement and non-engagement frequency was higher than its sometimes, often, and always scales which rose mildly and reduced softly. Two points of frequency in the second and third classes stood in the highest position. The longer time negative engagement and non-engagement's scale lasted, the lower frequency it possessed. On the other side, pupils' seldom and always scales of positive engagement were dominant. Both tended to go down first then went up. But the increasing of positive engagement's always scale was sharper than its seldom scale. The sometimes and often scales of positive engagement tended to have a slight growth then a gentle decrease. Overall, pupils' positive engagement frequency was superior to that of negative engagement and non-engagement. Positive behaviors occurred most during each class.

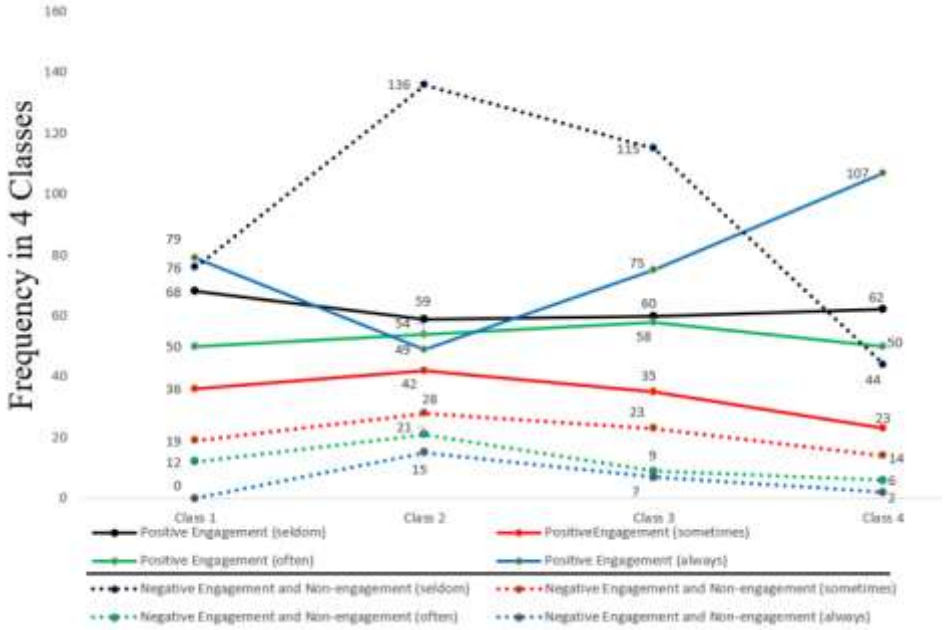

Figure 5 Frequency of positive engagement, negative engagement and non-engagement

In summary, mean values of post-test in experimental group are higher than those in control group. This meant that play-based instruction contributed to improving pupils' vocabulary learning. The sum of positive engagement level was more than negative engagement and non-engagement in each class. Pupils' positive engagement was observed more frequent than negative engagement and non-engagement. Pupils' behavioral engagement (positive and negative) and non-engagement was dominated, followed by cognitive and affective data. Pupils using the game materials as required was the primary behavioral engagement. The main behavioral non-engagement was moving from one place to another to try different games and acting as overlookers. As for frequency observed, the rankings of always, often, sometimes, and seldom scales were respectively cognitive, behavioral, affective; behavioral, cognitive, affective; behavioral, cognitive, affective; behavioral, affective, cognitive.

Discussion

1. Effectiveness of play-based instruction on vocabulary learning

The first finding was that the post-test mean value of the experimental group's English pronunciation and Chinese meaning mean recognition were higher than those of the pre-test while there was only slight difference between the control group's English pronunciation and Chinese meaning mean values pre-test and post-test. It suggests that play-based instruction is more effective than rote instruction for pupils' learning English vocabulary in both recognition of word meaning and pronunciation.

In the current study, a play-based class is composed of circle time, teacher guided-play and child-guided free play. Circle time is a process of reinforcement input of cramming. Pupils try to memorize the words by imitating teacher's pronunciation. Some concrete words, like noun, verb, and adjective, are learned by imitating teacher's actions just as total physical response. The primacy of accommodation over assimilation happens in the phenomenon of

imitation (Piaget, 1962: 87). If pupils cannot memorize the words, they would not be able to read (an evident in Item 6 of observation checklist) and they would ask teacher or peers for help (as shown in Item 2). The engagement findings show that this behavior reduced while they read words better from Class 1 to Class 4. During the circle time in the first class, pupils may not realize that the vocabulary would be used in games. They paid less attention to cram as usual. When they engaged in child-guided free play, they were required to follow game rules and read the words. Some pupils may not keep the pronunciation of new words in mind and asked teacher and peers for help. However, they paid more attention to cram in circle time and needed less help of asking how to pronounce in child-free play in the following three classes. This was one of the possible reasons why the sum of Item 6 (Follow the rules of games and read the words.) rose and that of Item 2 (Offer help to peers or receive teacher and peers' help.) dropped.

Piaget (1962: 87) defined play as assimilation. Games in guided-play and free play provided pupils the opportunity to practice the vocabulary previously learned in circle time. In teacher guided-play, teacher played scaffolding role. Vygotsky (1967: 6-18) emphasized that children's cognitive development is strengthened when they are guided to play and operated within the zone of proximal development. Play can create the zone of proximal development (Nilsson & Ferholt, 2014: 919). In this study, the researcher acted as the role of activities planner, organizer, facilitator, guide, leader, advisor and protecter. In the third class, the teacher guided-play was a game named "flyswatter". The researcher gave commands by reading the words randomly and the participants swatted the target fly as quickly as possible. When the game "flyswatter" was over, it would be free play time. But some pupils showed great interest in the game "flyswatter" and asked for permission to continue to play it in free play. That meant pupils would take turns acting as the one who gave command, and the commander must master the vocabulary very well because the researcher's scaffold was removed. When games began, the commander spent seconds to recall the pronunciation and hesitate to give command. As time went on, the commanders made themselves master to give command with every word. The classroom was full of enthusiasm in the third class. The main joy rooted in the game "flyswatter", which contributed to increasing number of Item 7 (Emotions generated as the related engagement in game activities) in the third class.

In previous studies, Yu (2017: 7) stressed that game teaching mode is significantly superior to traditional teaching because games promote knowledge extraction. He found that when pupils were playing games, some pupils not only acquire English pronunciation and Chinese meanings from other classmates, but add the spelling to the next classmates, which helped to strengthen phonetic representation, formal representation, and semantic association. Furthermore, games can promote pupils' interest and engagement (Pho & Dinscore, 2015: 1-5). In Yu's (2017: 7) research, brightly colored pictures aroused pupils' interest. In this study, pupils were attracted by multiple prepared materials such as colorful paper fish, paper flies, and tails made of cloth, fishing rod, and a mysterious container written with "Kaboom".

Dolati and Mikaili (2011: 1218-1224) revealed that games benefit pupils in learning vocabulary and keeping new words in mind which was also supported by Nguyen and Khuat (2003: online). Dolati and Mikaili (2011: 1218-1224) also found that pupils who attended normal teaching lessons made tolerable noise so that teacher had little effect on controlling the class while pupils who received games instruction also had a high level of noise but the game playing environment was controllable. Another finding was that pupils are willing to try and not afraid of making mistakes in game playing setting. On the contrary, nobody

volunteered to answer teacher's questions in normal teaching classroom. It was proved that games can promote pupils' engagement (Rawi & Zain, 2021: 328-329).

2. Effectiveness of play-based instruction on pupils' engagement

The second finding was that the participants' sum of positive engagement observed in four classes was twice higher than that of negative engagement and non-engagement and the time spent on positive engagement was longer than that of negative engagement and non-engagement. It implies that pupils' positive engagement was at a high level as opposed to negative engagement and non-engagement. It is obvious that the items pupils kept high level of positive engagement were: correct operation (Item 1) and pay attention on playing games (Item 5). Most pupils were observed to operate game materials correctly and concentrated themselves on playing games at most of time. It could be inferred that being able to operate game materials correctly was a clear mark of positive engagement. Montessori (1965: 66) claimed that materials in the classroom environment are especially important for the children to learn. Pupils need to manipulate objects to maintain their concentration in play-based class. Montessori educators realized it is important to select materials which draw children into concentration (Chattin-McNichols, 2016: 34-43). For young learners, play materials should be selected appropriately based on specific and meaningful learning goals. In this study, game materials of teacher guided-play were different in four classes while those of free play were the same. Pupils who play the same games over a period will gradually lose interest. What's worse, during the last several minutes in the fourth class, some pupils complained that they had been bored playing the games arranged in free play. Pupils tend to prefer experiencing new objects. Therefore, when teachers select which games to play, the shelf life and the variety of materials should be considered.

Play-based learning allows students to build relationship with other learners with different characteristics and increases their learning outcomes and enjoyment (Yunianti, 2020: 67). In the fourth class, the sum of pupils' positive engagement reached the peak value while sum of pupils' negative engagement and non-engagement dropped to the minimum. A group which was spontaneously made up of three boys and two girls attracted the observer's attention from the video record. No matter what game was played, the members of this group always played together and never dissolved. They had high concentrations and great team spirit. Negatively, it was observed that three girls of the other group sat on the chairs and waited for the bell one minute before the end of class. But this group was unaware of their surroundings and was still concentrated on playing games in a circle. It proves that positive interaction of team members reinforces play and learning, which improves pupils' engagement.

One of the possible reasons why it could be observed that pupils abused game materials in four classes (Item 13 in Figure 7 and 8) was that the researcher only showed the pupils how to operate the game materials correctly but not the incorrect ways. As a result, pupils "invented" many new play styles with materials which is not related to vocabulary learning. By comparison, pupils have a clear distinction between what can be done and what is forbidden. Moreover, teachers should forecast which pupils probably appear mischievously. Those pupils should be focused on primary observation.

The pupils number observed of Item 15 (Physical fights) broke zero in the second class. A boy could not wait for his turn to play the game "fishing with magnets". He disrupted game order by moving the fish back and forth. A girl warned him but in vain. She grabbed his clothes and scolded him for seconds. In this case, teachers must immediately stop pupils from

misbehaving and emphasize classroom discipline. In addition, looking, naming, and questioning (Zuckerman, 2007: 4-16) have disciplinary function. A teacher is standing beside a misbehaved pupil and keeps looking. A misbehaved pupil is named or asked question by the teacher with a slow rising tone. This effectiveness is much better than negative reinforcement like warning, scolding, and reprimanding to deal with misbehaviors.

Conclusion

The present findings uncovered that play-based instruction is more effective than rote instruction on vocabulary learning in primary schools. This study supports previous studies in that game enhances pupils' ability to memorize words (Bakhsh, 2016: 120-128; Derakhshan & Khatir, 2015: 39-47; Huyen & Nga, 2003: 90-105) in both English pronunciation and Chinese meaning. Furthermore, pupils' positive engagement level is higher than their negative engagement and non-engagement in free play. Operating the games materials correctly and keeping concentration on playing were two main forms pupils engaged in.

Recommendations

In consideration of foreign language beginners, vocabulary instruction in this study only involves words pronunciation and Chinese meanings. Grammar and usage are not considered. To ensure pupils' ability of expressing meaning exactly, only content words are tested. Meanwhile, an equal amount of content words is chosen in tests to make the pretest and posttest paralleled instead of all words.

Future research could be conducted on more games over a longer period to find out if all the games are effective on learning vocabulary or which kinds of games are more effective than others. The evaluation could be more than oral test. Written test should be considered. Other skills, listening, speaking, reading, and writing are also considered to be taught through play-based instruction.

Classroom games which contain educational purposes were different from mobile games and video games. Guardians generally hold the view that games make children lose interest in study even become addicted to play. Practically, it is persuasive that guardians are invited to attend demonstration lessons used play-based instruction. Only through personal experience and feelings can guardians realize that children can gain knowledge and enjoyment from play.

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