A Study of Intercategorial Polysemy Teaching Based on Conceptual Blending Theory in Senior High Schools

Hong Duan[1], Qingling Wang[1(✉)], and Lihua Xia[2]

[1] School of Foreign Languages and Literature, Yunnan Normal University, Kunming 650500, China
2316207767@qq.com
[2] Experimental Junior Middle School of Suzhou Hi-Tech & New District, Suzhou 215010, China

Abstract. This thesis adopts Conceptual Blending Theory into intercategorial polysemy teaching in senior high school, so as to test the effectiveness of the new teaching method based on CBT. The findings of this thesis are demonstrated as follows. Firstly, after two months instruction, the mean score of posttest 1 in the EC is 10.93% higher than that of the CC and the value of Sig. is 0.017. It suggests compared with the traditional method, the new polysemy teaching approach based on CBT is effective in polysemy teaching. Secondly, two weeks later, the mean score of posttest 2 in the EC is 36.28% higher than that of the CC and the value of Sig. is 0.000. It supports the idea that the new polysemy teaching approach is more beneficial to students' long-term retention. Thirdly, a month later, the mean score of posttest 3 in the EC is 6.29% higher than that of the CC and the value of Sig. is 0.030. It means that in comparison with the traditional method, the new polysemy teaching approach can improve students' independent learning capability. Furthermore, the paired-sample test value of Sig. in the EC is 0.032 while the paired- sample test value of Sig. in the CC is 0.539. It gives evidence that the new polysemy teaching approach makes a big difference to the experimental class while the conventional teaching method doesn't have the same effect on the control class.

Keywords: Conceptual blending theory · Polysemy teaching · Senior high schools

1 Introduction

Polysemy is the characteristic of a single word which has two or more distinct but related senses. It is a common phenomenon in natural language. Within the vast array of new cognitive linguistics of polysemy construction, most of the researchers analyzed polysemy from their spatial structures based on image schema theory (Talmy 1988). The networks were frequently applied to terms such as on, above, below, outside, to the right (left) of, across, and into for spatial relations and motions (Chen and Xu 2009). Whilst some were keen on the meaning extension mechanism of polysemy in terms of metaphor, metonymy and prototypical categorization (Lakoff 1987; Goossens 1990;

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Verspoor 1998; Langacker 1999; Boers 2000; Liang 2002; Csabi 2004; Xu and Huang 2006; Liao 2009; Liu 2010; Kuang 2010; Guo 2012). All these researches accelerate the analyses of polysemy, especially monocategorial lexical polysemy, in different angles, and some of them suggest effective ways to help students learn polysemy better. As opposed to these linguistic theories, Conceptual Blending Theory (CBT for short) emphasizes the on-line processes of meaning construction (Fauconnier 1985, 1997; Fauconnier and Turner 1996, 1998a, 1998b, 2002), which lead to better understanding of polysemy. Within the paradigm, Zawada (2007) did a research on intercategorial lexical polysemy on CBT, as a supplement to former monocategorial lexical polysemy research. But up to now, there has been no empirical research on polysemy teaching from the perspective of CBT in senior high school. This research is aimed at the effective intercategorial polysemy teaching based on CBT in middle school.

2 Methodology

2.1 Research Questions

This study aims at testing the effect of application of conceptual blending to English polysemy teaching and learning process. To be specific, the purposes of this experiment are to answer the following questions:

(1) What is the current situation of students' English polysemy learning?
(2) What effects does the CBT-based polysemy teaching method have on students' understanding of different senses of polysemous words?
(3) What effects does the CBT-based polysemy teaching method have on students' long-term retention of polysemy?
(4) How much can the CBT-based polysemy teaching method improve students' ability of independent polysemy learning?

2.2 Research Subjects

There are 72 students involved in the experiment. All of them come from two classes in Grade one from Tangyang Senior High School where the author works as the English teacher of two classes. All the subjects are interested in the experiment and they volunteer to provide real information during the experiment. First, the two classes receive a test. It turns out that they are at the similar level of using polysemous words they have learned. So Class 1 made up of 36 students is chosen as the experimental class (EC); while Class 2 consisting of 36 students is treated as the control class (CC) to participate in a contrastive and empirical study. After that, the author will teach these two classes using the same materials and textbooks. However, the subjects of each class are exposed to different ways of polysemy teaching and learning. The experiment will last for three and a half months.

2.3 Instruments

In the study, we comb students' books from Module 1 to 8 in middle school in Jiangsu province, then sorts out 88 polysemous words that are used as intercategorial polysemy, which covers seven elements, namely locatives, instruments, results, occupations, human relations, animal's characteristics and emotions. The main instruments which help to put the experiment plan into practice are composed of a questionnaire and four times of polysemy tests. A questionnaire is used at the beginning of the term to get a general information and make the researcher know the subjects' capability of polysemous words better. Four times of polysemy tests are carried out step by step. A pretest, followed by three posttests on different purposes, is conducted in both classes. However, polysemy teaching, as part of daily teaching activities, differs in two classes.

2.3.1 Questionnaire

The questionnaire is scheduled to conduct at the beginning of the term. The purpose of the questionnaire is to get the information about students' attitudes towards polysemous words, as well as their strategies on studying polysemous words. Its theoretical basis is the O'Malley and Chamot's (1990) classification of learning strategy. The questionnaire consists of the instructions and 12 questions indicating the participants' attitudes towards polysemy, self-learning strategies and memorizing strategies. The participants are told to finish the Five Point Likert Scale. "5" represents the complete agreement. "4" means usual agreement. "3" stands for uncertainty. "2" refers to usual disagreement. "1" has the meaning of complete disagreement. The participants are supposed to choose only one answer which can represent the real situation.

2.3.2 Tests

The polysemy tests in the whole experiment are made up of one pretest and three posttests. Each test contains 10 target polysemous words. There are two criteria to select the target words. One is that 10 words in each test are selected from the students' book in Grade One. The other one ensures that there are at least three different senses of each target words students are required to master during the middle school period. Each test will give the target word first, followed by the core senses of the word. Then several sentences containing the target words will be presented. Subjects are required to match these sentences with the correct meaning of the target word provided above. Each time of the correct match will guarantee them one score. Each test will be finished in 40 min. Subjects are required to finish them alone, with no discussion between classmates and no additional instruments, such as the dictionaries.

2.4 Procedures

The whole procedures could be divided into six steps. In brief, a questionnaire was scheduled to conduct at the beginning of the term. Then a pretest was conducted before teaching activities. In the next step, different teaching activities were undertaken, with a new approach under the guidance of CBT in the experimental class but a traditional way in control class. After two months, posttest 1 was conducted to verify the effectiveness

of the new approach on understanding polysemy. Two weeks later, posttest 2 was carried out without any warning to test the students' acquisition of the same polysemous words which had been tested in posttest 1 and long-term retention of those words. Posttest 3 was performed a month later to test whether subjects could guess the polysemous words independently even though these words hadn't been taught in class.

Step 1: Questionnaire
The questionnaire was conducted at the beginning of the term. The purpose of the questionnaire was to get the information about students' attitudes towards polysemous words, as well as their strategies on studying polysemous words. The questionnaire was applied to all the students in Grade one including experimental class and control class on September 3. The teachers were in each class to read the instructions of the questionnaire to make students understand that there was no standard answer to each question and what they needed to do was give the honest answer. Students could consult the teacher whenever they came across with questions. The questionnaire was finished in 15 min. The aim of the whole experiment was to make it clear what the situation of vocabulary learning was at present and to check the necessity of finding an effective way to teach polysemy to middle school students.

Step 2: Pretest
The pretest was carried out the next week. The author selected the target polysemous words, each of which was presented with four or five different senses and the sentences corresponding to each senses. The aim of this test was to evaluate subjects' capability of understanding polysemy according to the background information obtained from the context of the sentences, and to test whether there was significant difference in this capability between the experimental class and the control class. The participants looked anxious when they first saw this kind of test. To relieve their anxiety, the author told them that it was a test to check their present level of polysemy, the results of which was collected for teaching adjustments and had nothing to do with the evaluation of their daily performance or final grades. The pretest was finished within 40 min.

Step 3: Teaching Activities
After the pretest, the new approach to teaching polysemy which was based on CBT was adopted in the experimental class. At first, the author introduced some basic knowledge CBT to the students, including the types of blending and how the blending took place when people used polysemy of a word to express different situation. It aimed to arouse their cognitive mechanisms to learn polysemy better. The author explained numerous samples to the students with drawings to make the theory visible and understandable, such as the polysemous words "limit", "failure", "comfort", "loss" and so on. The majority of the examples were adopted from the eighth version of the Oxford Advanced Learners' English-Chinese Dictionary. This dictionary played an important role in the whole experiment. It functioned as the a reference to select polysemous words as well as to illustrate the connections among different senses.

The students in the control class were taught about the senses of those words one by one in a traditional way. In this case, there was no need to guide students how to figure out exactly the relationship between the senses, or to tell why there was such a development of the polysemy.

Step 4: Posttest 1
Students were exposed to different approaches to dealing with polysemy for two months. Then posttest 1 was concluded to test whether the approach adopted in EC had positive effects on students' capability of polysemy. The layout of posttest 1 was the same as that of the pretest. The words were adopted from different units of students' book. They had already been taught, but the author taught them in different ways on purpose. The test lasted for 40 min under the supervision of the author.

Step 5: Posttest 2
After posttest 1, the author explained the target words together to the students in different classes in different ways. After the test paper review class, the author reminded students of referring to the test paper in their favorite ways at their spare time. There was no advance warning of the next test to be given.

Two weeks later, posttest 2 was conducted on schedule in both classes. The test was designed the same as the posttest 1. They shared the same target words. The author made slight changes of the sentences to make them look new and different, but actually they provided the same context. Posttest 2 was designed to check whether this new polysemy teaching approach had great effects on students' long-term retention of polysemy.

Step 6: Posttest 3
The posttest 3 was conducted a month later to check whether the new polysemy teaching approach improved students' ability of independent polysemy learning. Therefore, the target words in posttest 3 were not taught in advance to the students. All subjects were expected to finish the test with their polysemy capability they had developed this term.

2.5 Data Collection

Five parts of the data require collecting in the whole experiment to guarantee the follow-up analyses. Generally speaking, they are about a questionnaire, a pretest and three posttests. The SPSS software is widely used in this kind of thesis. "Independent-samples t-test", "paired-samples t-test" and "frequency test" of the data are scientific angles to calculate relevant data. These steps are fundamental to the experiment and giving convincing evidence to evaluate the experiment. In addition, some related figures and tables are required to be finished by Excel.

3 Results and Discussion

3.1 Results and Analyses of the Questionnaire

140 questionnaires were sent out to students in Grade One in Tangyang Senior High School. All the results of 120 valid questionnaires were input into SPSS 17.0. The questionnaire is a Five Point Likert Scale. The scores from five to one stand for students' response to the situation from complete agreement to complete disagreement. Mean scores and frequencies are calculated to illustrate the students' attitudes towards polysemy, self-learning strategies and memorizing strategies. The following tables

exhibit the scores of each strategy. If the score gets higher than 4 points, the item is regarded as the highly common phenomenon.

The first three questions make up the part to test students' attitudes towards polysemy. The results below respectively show that students have awareness of the high percentage of polysemy existing in English vocabulary (Table 1).

Table 1. Frequency chart (Q1–3)

	Q1	Q2	Q3
N Valid	120	120	120
Missing	0	0	0
Median	3.90	3.90	3.32
Mode	4.00	4.00	3.00
Sum	4	4	3

At the same time, they feel confused when using polysemy. About 19% of the students would rather skip it, while half of the students would find ways to overcome it, as is shown in Fig. 1. In a word, the figure shows the importance of teaching polysemy and students' curiosity on effective ways to learn polysemy.

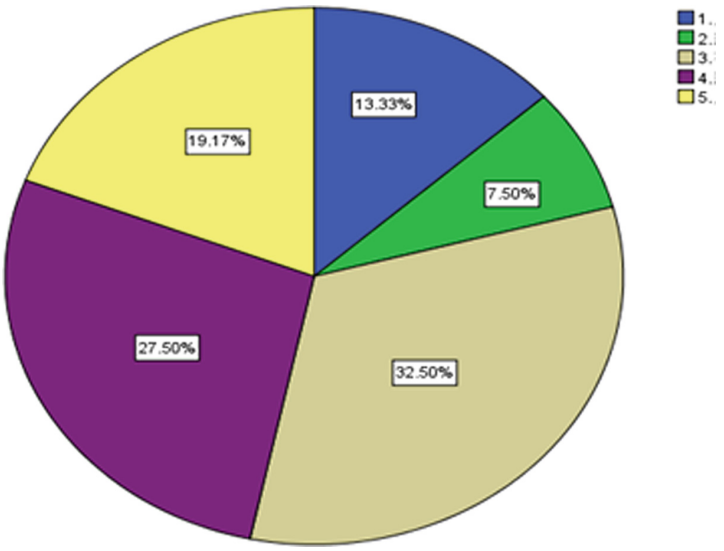

Fig. 1. Frequency chart (Q3)

Students' self-learning strategies are made up of Q 4, 5, 7 and 8. The Figure below indicates that compared with discussing with classmates, referring to the dictionary, finding meaning connection and guessing from the context are their self-learning strategies. But through Q6, they declare that they have the awareness of the interrelations among different senses of a word, but they never perceive the underlying rules, which leads to the inaccuracy of understanding, as is shown by Q9 (Table 2).

Table 2. Frequency chart (Q4–9)

	Q4	Q5	Q6	Q7	Q8	Q9
N Valid	120	120	120	120	120	120
Missing	0	0	0	0	0	0
Media	3.11	3.58	3.81	3.56	3.65	3.74
Mode	3.00	4.00	4.00	4.00	4.00	4.00
Sum	3	4	4	4	4	4

Students' memorizing strategies are shown in Table 3. The media and mode value of Q11 indicates that understanding polysemy in sentences is likely to be their better choices.

Table 3. Frequency chart (Q10–12)

	Q10	Q11	Q12
N Valid	120	120	120
Missing	0	0	0
Media	3.9	3.67	3.53
Mode	4.00	4.00	4.00
Sum	4	4	4

The data of Q10 reveal that more than one third of the students are unwilling to list various meanings, then memorize them by rote. More than half of the students think it unnecessary to recite all the senses at a time, which indicates by the data of Q12. The results are vividly shown in the following two figures (Figs. 2 and 3).

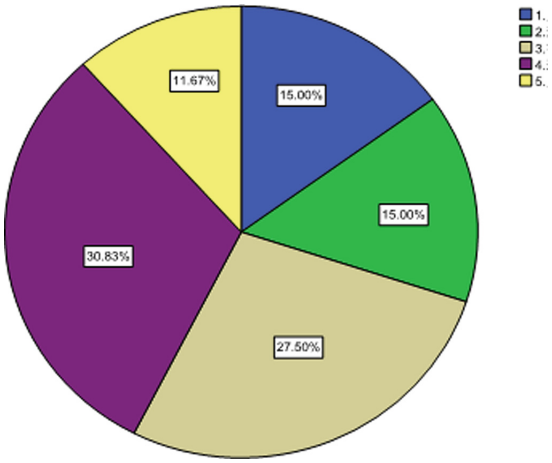

Fig. 2. Frequency chart (Q10)

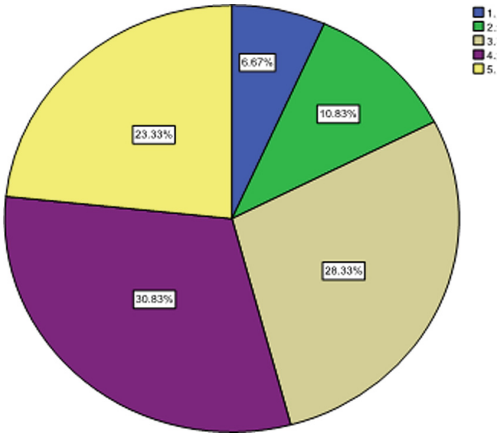

Fig. 3. Frequency chart (Q12)

As is indicated above, students feel confused about polysemy learning. An evident contradiction can be sensed that students want to learn polysemy well but they are lacking in skills. The majority of students have found polysemy common in English and they are fully aware of the importance of polysemy learning. They also acknowledged that they had much difficulty in understanding various senses. On the other hand, they considered memorizing the senses of words by rote as the ineffective way in their learning and they agreed that there exist relations between the senses though they can't make it clear. An agreement can be reached from the analyses in this part that it is high time to explore a new approach to teaching polysemy. The author believes the conceptual blending approach is likely to be a better way to deal with the tough situation. The new approach attracts students' attention on the relations of the meaning and presents clearly how the related meanings are developed in different sentences.

3.2 The Pretest of the EC and CC

The pretest was designed to check whether the students in the experimental class and the control class had the similar capability of understanding polysemy based on the context obtained from the sentences before the whole experiment. 10 target words were listed on the pretest paper, of which eight polysemous words were presented with five different senses and the other two were presented with four different senses. If the students make a right match, they will score one point. On the contrary, if the students make a wrong match, no point will they get. The scores sum up to 48 in total (Table 6).

The Table 4 shows that there are 36 students in each class taking part in the pretest. The mean score in class 2 is slightly higher than that of class 1, which indicates that class two has a little bit individual difference in English proficiency, but it is not quite obvious.

Table 4. Group statistics of the pretest scores

Class		N	Mean	Std. Deviation	Std. Error Mean
pre	EC	36	25.14	6.165	1.028
	CC	36	25.64	6.298	1.050

Only descriptive statistics are not enough. Further proof is provided by independent samples t-test. The first value of sig. in "Levene's test for equality of variances" is 0.825. According to the software, if the value is higher than 0.05, the equal variances are assumed. So the next step is to read the data from the "equal variances assumed". As is shown in the Table 5, the value of Sig. (2-tailed) reaches 0.735, which is greatly higher than 0.05, and reaching 1.00. It can be concluded that there is little difference between the pretest scores of class 1 and class 2. That is to say, there was no significant difference in the polysemy ability they had developed until that moment. Now that subjects in class 1 and class 2 are regarded at the similar level of inferring different senses according to context provided by each sentences, class 1 can be reasonably appointed to be the experimental class (EC), while class 2 will be regarded as the control class (CC) out of question.

Table 5. Independent samples test of the pretest scores

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
pre									
Equal variances assumed	.050	.825	−.340	70	.735	−.500	1.469	−3.430	2.430
Equal variances not assumed			−.340	69.968	.735	−.500	1.469	−3.430	2.430

3.3 The Tests During the Experiment

3.3.1 The Effectiveness of the New Teaching Approach

The posttest 1 was conducted after the teaching activities for two months. 10 target words were listed on the pretest paper, of which eight polysemous words were presented with five different senses and the other two were presented with four different senses. If the students make a right match, they will get one point of the scores. On the contrary, if the students make a wrong match, no point will they get. The scores sum up to 48 in total.

Table 6. Group statistics of posttest 1

Class		N	Mean	Std. Deviation	Std. Error Mean
post 1	EC	36	28.81	6.541	1.090
	CC	36	23.56	5.321	0 887

It is quite evident that the mean score of the experiment class is much higher than the control class after two months' teaching with different methods. The value of Sig. (2-tailed) is 0.000, which is lower than 0.05. It indicates that significant changes have taken place in the scores of the experimental class after the teaching activities. It strongly proves that the teaching activities conducted in the experimental class have a positive effect on the students' learning (Table 7).

Table 7. Independent samples test of posttest 1

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
post 1									
Equal variances assumed	2.732	.028	3.736	70	.000	5.250	1.405	2.447	8.053
Equal variances not assumed			3.736	67.213	.000	5.250	1.405	2.447	8.055

The following step is to make the data comparison between the pretest and the posttest 1 in the experimental class (EC) and the control class (CC). It is clearly shown that the value of Sig. (2-tailed) in the EC is 0.017, which is much lower than 0.05, indicating significance improvement due to the new teaching method, while the value of Sig. (2-tailed) in the CC is 0.14, suggesting no significant disparity during these two months' study (Table 8).

Table 8. Paired-samples test post-test 1

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Deviation	95% Confidence Interval of the Difference				
					Lower	Upper			
EC	pre-post1	−3.667	8.796	1.466	−6.643	−.690	−2.501	35	.017
CC	pre-postl	2.083	8.275	1.379	−.717	4.883	1.511	35	.140

3.3.2 Students' Long-Term Retention of Polysemy

The posttest 2 was conducted two weeks after the posttest 1 evaluation and explanation with different methods. Students in both the EC and the CC are not required to recite the polysemy of the target word, and they were not informed of the test in advance. The posttest 2 was designed the same as the posttest 1. They shared the same target words. The author made slight changes of the sentences to make them look new and different, but actually they provided the same context. As is clearly shown that the mean score of the posttest 2 in the EC is much higher than the mean score in the CC (Table 9).

Table 9. Group statistics of posttest 2

Class		N	Mean	Std. Deviation	Std. Error Mean
post 2	EC	36	37.61	7.736	1.289
	CC	36	26.31	5.440	0.907

The value of sig. (2-tailed) is 0.000, which is even lower than 0.001. The result indicates there is significant difference in the scores of two classes in the long-term retention. Because the new method of commenting the test paper in the EC is based on CBT, it strengthens students' understanding of target words intensively and enhances their long-term retention of target words. The scores of the experimental class are especially remarkable, compared with those of the control class (Table 10).

Table 10. Independent samples test of posttest 2

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
post 2									
Equal variances assumed	3.891	.049	7.173	70	.000	11.306	1.576	8.162	14.455
Equal variances not assumed			7.173	62.812	.000	−11.306	1.576	8.156	14.449

3.3.3 Students' Ability of Independent Polysemy Learning

A month later, posttest 3 was conducted without any advance warning to students in both classes. The target words in this test were not mentioned or given special explanation of in daily teaching process these days. The aim of the test is to check whether the new polysemy teaching approach can improve students' ability of independent polysemy learning. As is clearly shown in the below table, the mean score of the posttest 3 in the EC is higher than that of the CC. Students in the EC are likely to develop high-level polysemy-learning ability (Table 11).

Table 11. Group statistics of posttest 3

Class		N	Mean	Std. Deviation	Std. Error Mean
post 3	EC	36	28.42	6.082	1.014
	CC	36	25.53	4.902	0.817

At the same time, the value of sig. (2-tailed) is 0.030, which is even lower than 0.05. The result definitely suggests that students' ability of independent polysemy learning differs greatly. This kind of ability is what a learner needs to obtain during the process of learning. Posttest 3 indicates CBT can not only promote students' understanding of polysemy but also benefit their independent learning capacity of polysemy (Table 12).

Table 12. Independent samples test of posttest 3

	Levene's Test for Equality of Variances		t–test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
post 3									
Equal variances assumed	4.020	.049	2.219	70	.030	2.889	1.302	.292	5.486
Equal variances not assumed			2.219	66.975	.030	2.889	1.302	.290	5.488

To get more evidence, the author designed a "paired sample t-test" of the pretest and posttest 3. As is clearly shown in the following table, the value of sig. (2-tailed) is 0.032, which is even lower than 0.05. The result definitely suggests that there exists a large amount of difference between the level of the students in the EC at the beginning of the term and their level now. On the contrary, students in the CC don't achieve that change. The Table 13 indicates that three and a half months' teaching of polysemy with different methods gives rise to great discrepancy between the experimental class and the control class. The student in the EC improved a lot and there is significant difference from their level at the beginning of this term. The traditional teaching didn't make a big difference to the students in the CC.

Table 13. Paired-samples test of posttest 3

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
EC	pre-post 3	−3.139	8.435	1.406	−5.993	−.285	−2.233	35	.032
CC	pre-post 3	.806	7.789	1.298	−1.830	3.441	.620	35	.539

4 Conclusion

What the thesis concerns is to research whether the new teaching approach based on CBT has positive effects on polysemy teaching and acquisition in senior high school. Summing up the above results, a large number of students have found polysemy learning important but challenging in their study. The experiment was conducted in two classes of the similar polysemy learning level taught by the author. The experimental class was instructed with the new polysemy teaching approach while the control class was guided by the conventional teaching method. The data were collected mainly from four times of polysemous words tests and then SPSS 17.0 software was used to make horizontal and vertical comparative analyses of these tests. Compared with the traditional method, the new polysemy teaching approach based on CBT is effective in polysemy teaching. Moreover, the new polysemy teaching approach is more beneficial to students' long-term retention. Finally, in comparison with the traditional method, the new polysemy teaching approach can improve students' independent learning capability.

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