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The Effect of Reading for Discussion Model on Incidental Vocabulary Acquisition

Qin Xu

Department of Ethnology, University of Chinese Academy of Social Sciences, Beijing 100000, China
Email: 1803691705@qq.com

Abstract: *This study examined the effect of reading for discussion model (RfD model) on the incidental vocabulary acquisition (IVA) in comparison with a more the traditional teaching model. The 84 college students were then recruited as participants and were divided into two groups (42 vs. 42) which were designated as the experimental group and the control group. The experimental group was received with the RfD model teaching practices, while the control class underwent a more the traditional teaching model which was commonly practiced in the setting of college English teaching in China. After the experiment, all the students were tested two times (i.e., immediately after the class, and 15 days later) with vocabulary knowledge test (VKT). The data of VKTs analyzed by software SPSS16.0. The results indicated that, although the experimental and control groups achieved quite approximate outcomes in the immediate test of IVA, the experimental group performed much better than the control group. The advantage of the RfD model over the traditional model is that the RfD model gives more benefits on the long-term vocabulary retention. Therefore, as a novel English teaching model, the RfD model will make a great influence on English vocabulary teaching and learning. However, there were a few limitations for this study, so the further study should be conducted from other aspects to verify the effectiveness of RfD model.*

Keywords: *the RfD model, the traditional teaching model, IVA*

1. Introduction

Incidental vocabulary acquisition (IVA) was a way to acquire English vocabulary in language teaching and learning (Bird, S., 2012). Therefore, testifying whether an English teaching model is effective depends on whether it promotes IVA for learners. The RfD model, as a novel teaching model (Wu & Huang, 2018) has caused more scholars' attention. This study aims to testify what is the effect of RfD model on IVA and if it has a better effectiveness in IVA than the traditional teaching model.

In China, most college English teaching is still in a traditional manner which leads to students' low English competence (Erçetin, G., 2010). Generally, students' low English competence English was caused by the traditional teaching model of the textbook-oriented, teacher-dominated teaching pedagogy. Thus, the RfD model proposed by Wu and Huang (2018) based on interaction hypothesis aims to create a social or communicative context in which students, especially the college students who have received English education for many years under the traditional classroom environment, can contact and interact with others in English. In essence, the RfD model attempts to build "shared responsibility" or "shared intentionality" (Potts, C. A. et al., 2018) by creating content and language "knowledge gaps". The RfD model focuses on training students' reading, writing and oral expression skills, so that students can improve their foreign language competence through continuous reading, writing and speaking practices (J. B. Heation, 2013).

As early as the 1970s, Hatch proposed that verbal interaction is the basics for second language acquisition. In almost the same period, Krashen proposed the "input hypothesis" that learners acquire L2 by comprehending language input ("i+1") that exceeds their current level. In the 1980s, Long conducted a series of studies on the interaction, further developed Hatch and Krashen' s ideas, formed an interaction hypothesis, and proposed that the modifications in oral interactions can help learner' s understanding of the input and can lead to L2 acquisition. In the mid-to-late 1980s, Swain (1985) made one step further, and asserted that simple interaction was not enough for ultimate acquisition. Learners also needed output, that is, "forced output", emphasizing language use beyond the learner' s current stage (e.g., using new words or sentences). Through the use of new language forms, learners can notice the gaps in their language skills and actively seek better ways to express themselves in conversational interactions,

ISSN 2616-5783 Vol.4, Issue 4: 71-81, DOI: 10.25236/AJHSS.2021.040416

thereby enhancing L2 acquisition. Later, many important concepts related to interaction were proposed, such as negotiation for meaning, language-related episodes (LREs), focus on form/meaning feedback, absorption and comprehension (intake/uptake), and so on. The introduction of the interaction hypothesis has had a major impact on foreign language teaching and learning in classroom settings.

However, by the end of the 1990s, researchers began to realize that there are still many problems with the above interaction theory (Webb, S., & Chang, C. S., 2015). For example, the interaction theory separates language competence from social processes, and believes that cognitive development can only be realized through individuals' internal brains (Van Compernolle, 2015). In the process of rethinking and reviewing these issues, Vygotsky's social and cultural theory began to get L2 researchers' attention. The core point of this theory is psychological processes, such as learning is done through mediation, and language is an important mediation tool. Language, beginning with children, has its source of "society". Through interpersonal interaction, and finally through internalization, language becomes a mediation for individual thinking (Jakonen, T. & Morton, T., 2015). Therefore, communicative interaction involves both external social and internal-psychological processes and communicative interaction is both the source and the result of the internalization process (Schmitt, N., 2010).

Several studies were conducted the effect of separate teaching models instead of combing the reading and discussion model on IVA, such as, Lu, M. (2013) showed that there were significant differences in IVA under different discussion and reading tasks. DeKeyser, R. M. (2014) studied IVA and vocabulary retention after reading and discussion tasks. The results showed that the vocabulary acquisition effect of the reading group was better than that of the discussion group. Hulstijin (2003) conducted a study on the effect of discussion and reading on IVA based on the input hypothesis and concluded that IVA in discussion process was better than IVA in reading process in terms of vocabulary retention effect. Hidi, S. et al. (2011) found that on the perspective of long-term vocabulary retention, reading model has a better effect than discussion model for college students.

After reviewing those studies, there is a gap could be found that the previous scholars pay much attention to the traditional teaching model which separately research on the effect of reading model or discussion model on IVA, instead of combining reading and discussion models. Due to the discussion is an important process of interaction, thus combining the two language acquisition patterns, reading and discussion, will bridge the research gap on the field of IVA study and is relatively significant for further studies in IVA.

Therefore, such research needs to be implemented from the perspective of interactional discussion in language learning. Besides, even though many studies have been proved that there are effects of the model of reading and discussion on IVA, but few of them focused on the long-term vocabulary retention. Besides, how could those different results was caused by vocabulary learning under reading and discussion model was still not clear to us. MOE (2015) testified that compared with the traditional teaching model, Chinese college students performed better under reading and discussion model on immediate IVA. Elgort, I., & Warren, P. (2014) also made a conclusion under a contrast experiment that reading and discussion model actually effect learners' IVA in immediate period, but for the long-term effectiveness of IVA, they did not give a clear explanation, neither the reason of causing the different acquired effect.

Many researchers agree that the development of vocabulary abilities, not only for children or adults, but also for native speakers or foreign language learners, is a "long- winded" process (Henderson & James, 2018), thus, the investigation of the effect of the RfD model on the development of learners' IVA is great significant. This study aims to testify to what extent the RfD Model can (cannot) affect IVA in comparison with a more the traditional teaching model.

2. Methodology

2.1 Research Question

The current research sought to assess the combined effect of the reading and discussion on word knowledge gains and retention. The aim of this line of research is to verify the effectiveness of RfD model through experimental treatment. The experimental group is under RfD model and the control group is under traditional teaching model. By comparing the experiment outcomes of two groups, this study is trying to answer the following question:

What is the effect of RfD model on incidental vocabulary acquisition (as measured by immediate

ISSN 2616-5783 Vol.4, Issue 4: 71-81, DOI: 10.25236/AJHSS.2021.040416

vocabulary knowledge test) and retention (as measured by delayed vocabulary knowledge test)?

2.2 Participants

The participants were 84 second-grade college students (40 males, 44 females) enrolled in two parallel classes at the Henan University of Technology. Among them, the males accounted for 48% and the females accounted for 52%. They ranged in age from 18 to 22, with an average age of 19. The 84 students were divided into the experimental group with 42 English-major students (20 males, 22 females) who accepted the treatment and the control group with remaining 42 English-major students (20 males, 22 females). All participants' data were valid because participants were required to complete this experiment and the score of their experimental test will be count into the final exam grade, so everyone performed well and their data of the test has statistical value. Everyone will get 20 RMB after experiment.

Judging from the scores they obtained in the final exam of Integrated English course in the previous semester, the mean score of experimental group is 83.98 and control group is 83.62, and the Std. Deviation (SD) of two groups are 4.45 and 4.68.

Table 1 Independent-Samples T-test Results of Two Groups' IntEngS

	Mean	Std. Error Difference	t	df	Sig. (2-tailed)
IntEngS	0.357	0.996	0.36	82	.72

Note: IntEngS= Integrated English Score

Exactly, in Table 1, the Independent-Samples T-test results of two groups show that the difference between control group and experimental group is insignificant (t (82) =0.36, p =0.72) and it represents the two groups were quite similar on their level of English proficiency. Therefore, the participants of two groups chosen as the experimental group member and control group member have the similar level of English proficiency which will not cause the differences of non-experimental factors.

2.3 Instruments

The instruments of the present study include a reading material, target words and vocabulary knowledge test and reading comprehension test. The reading material used in experimental group and control group is Virginia Driver's Manual—Virginia Department of Motor Vehicles. The target words are 10 pseudo-words replacing the 10 original real words in the material. The vocabulary knowledge test about lexical form-meaning connections is used to assess the word gain in immediate moment and to assess the word attention in delayed moment (one month later).

2.3.1 Materials

Reading materials. The Virginia Driver's Manual—Virginia Department of Motor Vehicles as the reading material came from the thesis of Xu (2018). It was an authentic English reading text with a lot of illustrated quality pictures, which had not been read before experiment for every participant.

Test materials. The participants are totally tested two times (i.e., immediately after the class, and 15 days later) with same VKTs. The VKT consists of two sections. The first section requires the test-taker to provide a Chinese translation for each vocabulary item. There are 20 items. Ten are the target pseudowords as introduced above and ten real English words as distractors. The real words are used as distractors but are not included in their total scores. The second section requires the test-taker to provide an English definition or a paraphrase for each vocabulary item. There are also 20 items. Ten are the target pseudowords and ten real English words, with the real words used as distractors and not included in their total scores. The VKT in immediate and delayed moment are the same. The immediate VKT is used to assess the word gain and the delayed VKT carried out to assess the word retention.

For the VKT, the student receives one point if they provide an accurate Chinese translation for a test item in the first section or an accurate English definition or paraphrase for a test item in the second section. If the answer is only partially correct, they will be given 0.5 point or 0 if the answer was incorrect. The total score for the vocabulary test is 20, whereas the scores of non-target words will not count into the total scores. Therefore, only 10 scores of target words will be taken into statistically calculated.

2.3.2 Target words

To achieve the aims of the experiment, 10 pseudowords were coined as the target words which occurred in the original places of 10 real words in this material. The pseudowords are, in fact, often

ISSN 2616-5783 Vol.4, Issue 4: 71-81, DOI: 10.25236/AJHSS.2021.040416

adopted by researchers in the studies of vocabulary acquisition (Jakonen, T. & Morton, T., 2015). Calculating the frequency of total words through AntConc, a corpus tool, the top 10 high frequency words were scientifically selected. They were the real words of Intersection, Yield, Pedestrian, Roundabout, Lane, Curve, Markings, Broken, Flash, and Pass. By control the factors of the frequency and morphology and orthographic representation, the 10 real words of Intersection, Yield, Pedestrian, Roundabout, Lane, Curve, Markings, Broken, Flash, and Pass were replaced by the 10 pseudowords as Pitorian, Tarriks, Bertion, Shild, Mebbe, Nerrotourt, Chourded, Kurch, Pesst, Slame. Table 2 shows all example words:

Table 2 The Statistics of High-frequency Words of AntConc

Real Word	Section1	Section2	Section3	Section4	Section5	Section6	Pseudoword
Pedestrian	12	10	7	6	9	5	Pitorian
Markings	11	5	4	8	5	8	Tarriks
Intersection	9	7	3	4	3	5	Bertion
Yield	8	5	2	7	7	3	Shild
Lane	7	8	6	5	4	3	Mebbe
Roundabout	6	6	3	3	2	4	Nerrotourt
Broken	6	4	4	5	2	5	Chourded
Curve	5	7	2	6	6	6	Kurch
Pass	5	6	9	2	3	4	Pesst
Flash	4	3	5	7	6	2	Slame

These words were evenly distributed several times across the different sections of this material. We then replaced these 10 words with pseudowords as shown in the following four examples. When the substitution was completed, we made sure that there were at least two sentences between the pseudo-words, so as not to cause too much difficulty to the readers' reading comprehension. Some examples of the material as follow:

Example 1:

Road ***tarriks*** (the replaced word: markings) guide and warn drivers as well as regulate traffic. ***Tarriks*** may be red, blue, yellow or white.

Example 2:

Before turning, you must come to a complete stop. Look both ways and ***shild*** (the replaced word: yield) the right-of-way to Pedestrians and other traffic.

Example 3:

If a traffic light changes from red to green while a ***pitorian*** (the replaced word: pedestrian) is in the street, allow the ***pitorian*** to cross the street before turning.

Example 4:

At a red light, come to a complete stop before you reach the ***bertion*** (the replaced word: intersection), stop line or crosswalk. Remain stopped unless turns are allowed on red.

Tarriks, shild, pitorian, bertion from the examples above are target words, namely pseudowords. These replacements did not basically change the sentence structures but maintain its authenticity.

2.4 Procedure

This study examined whether RfD model impacts on IVA. In order to figure out this issue, the study included the immediate vocabulary knowledge test and delayed vocabulary knowledge test (in 15 days) for the experimental group with treatment, as well as for the control group without treatment. The experiments of experimental group and control group are implemented by the same teacher. The immediate test was completed on December 15, 2019 and the delayed test was finished on December 30, 2019.

The 42 students of experimental group under RfD Model are divided into six groups with 7 students. The reading material will be accordingly divided into six sections orderly for six groups belonging to experimental group. Once given the material, each student spends around 15 minutes reading through it. They are told to read for comprehension and should not look up words in a dictionary. After reading through the material, discussion is initiated in each group. The discussion is comprehensive. It covers

ISSN 2616-5783 Vol.4, Issue 4: 71-81, DOI: 10.25236/AJHSS.2021.040416

any questions and problems which could be either language problems. While discussion is ongoing, note-taking is encouraged. After the discussion, each group is requested to come up with a written summary. The discussion is required to be done in 20 minutes. After the within-group discussion, each time 2 students in each group are sent to other groups, and meanwhile welcomed students from other groups to come to communicate what each group had read in their received materials. While sent to other groups, students are not allowed to speak Chinese (their native language) and carry the reading materials but allowed to carry the written note. When every student in all groups have been sent to other groups and have returned to their original group, the between-group came to its end. This also guarantees that each group has had students from all other groups to share their information. Through such communications, they obtain what they have not read in their own materials. The teacher acts as a facilitator and is ready to provide any assistance needed to make sure everything go on smoothly. The whole experiment lasts about 1.5 hours.

For control group, once given the materials, every student read through the whole reading materials. They are told to read for comprehension at their own pace and not to look up words in a dictionary. Rereading is allowed but they are required to finish reading in about 30 minutes. They are allowed to ask their teacher any questions regarding what they read, which could be either questions about difficult language problems like difficult words, phrases, sentences or grammatical points or subject matter questions like traffic rules or regulations. Like what a Chinese English teacher normally does in the reading class: the teacher spends about 15 minutes giving illustrations (difficult points), and then outlines or provides a summary of the content. Students write a summary of what they read and hand it in to the teacher. The four steps take about 1.5 hours.

The 15 days later, the participants of experimental and control group were required to take part in the test which was absolutely as same as the immediate tests, expect for arrangement in different orders.

2.5 Data Analysis

The quantitative analysis method is dominantly employed in this research. In the field of quantitative analysis method, SPSS 16.0 and R will be used to deal with research data. According to different questions, the statistical analysis methods of independent-sample t-test, paired-sample t-test and repeated-measures ANOVA are adopted differently to analyze the scores of immediate tests and delayed tests between experimental group and control group.

The research quesiton is proposed to answer what the effect of RfD model on incidental vocabulary acquisition as measured by immediate vocabulary knowledge test and vocabulary retention as measured by delayed vocabulary knowledge test is. For this question, the statistical analysis methods of independent-sample t-test, paired-sample t-test and repeated-measures ANOVA are applied in interpreting the data results. The statistical analyses were based on a dependent variable (the score of the immediate vocabulary knowledge test) and two independent variables of treatment (RfD model and traditional teaching model) and Time (immediate and delayed vocabulary knowledge test). The independent-sample t-test and paired-sample t-test is used to report the difference between and within two groups. The RM ANOVA with a mixed 2 (time) ×2 (group) design is adopted to show the significant and strong main effects for vocabulary knowledge retention.

3. Results and Discussion

The current research sought to assess the combined effect of the reading and discussion on word knowledge gains and retention. The aim of this line of research is to verify the effectiveness of RfD model through experimental treatment. The experimental group is under RfD model and the control group is under the traditional teaching model. By comparing the experiment outcomes of two groups, this study is trying to answer if the effect of RfD model is better than that of the traditional teaching model on IVA (as measured by immediate VKT and retention (as measured by delayed VKT).

3.1 The effect of RfD model and Traditional teaching model on IVA

The results of descriptive statistics of RfD model and traditional teaching model on IVA in immediate vocabulary knowledge test are shown in the following Tables including variables, standardized values and calculated data. Thus, it is necessary to clarify the definition of those abbreviations and statistic terminology applied in this section. To be specific, EG and CG as the abbreviations used in the study, refers to the experimental group and control group and VKT refers to vocabulary knowledge test. The

ISSN 2616-5783 Vol.4, Issue 4: 71-81, DOI: 10.25236/AJHSS.2021.040416

std. deviation (sd) is a measure that is used to quantify the amount of variation or dispersion of a set of data values (Altman, & Bland, 1996). A low standard deviation indicates that the data points tend to be close to the mean (also called the expected value) of the set, while a high standard deviation indicates that the data points are spread out over a wider range of values. Standard error of the mean is an estimate of standard deviation, derived from a particular sample used to compute the estimate. It is the same as the standard deviation of the estimates themselves.

Table 3 and Table 4 are the results statistical analysis of the independent-samples t-test used to compare the effect of immediate vocabulary knowledge gain between RfD model and traditional teaching model. Judging from Table 3 and Table 4, we can find that the subjects can acquire the vocabulary knowledge incidentally both under RfD model and traditional teaching model in the immediate vocabulary knowledge test but there is no significant difference of incidental vocabulary acquisition between experimental group under RfD model and control group under traditional teaching model in immediate vocabulary knowledge test.

Table 3 Descriptive Statistics of Immediate VKT

	Group	N	Mean	Std. Deviation	Std. Error Mean
Immediate VKT	EG	42	11.17	2.469	.381
	CG	42	11.26	2.264	.349

Particularly speaking, in Table 3, the *sd*-value of experimental group as 2.469 and control group as 2.464 are approximately low which indicates that data points of two groups tend to be close to the means. The mean of immediate vocabulary knowledge test of experimental is 11.17, which is little lower than 11.26, the mean of vocabulary knowledge test of control group. We can directly find that the mean score of control group is little higher than that of experimental group, but we cannot conclude that the effect of incidental vocabulary acquisition of traditional teaching model under control group is better than that of RfD model under experimental group. Therefore, the data needs to be further statistically analyzed.

Table 4 Independent-Samples T-test of Immediate VKT

	Levens' s Test for Equality of Variances		t	df	Sig. (2-tailed)	95% Confidence Interval of the Difference	
	F	Sig.				Lower	Upper
Immediate VKT	.400	.529	-.184	82	.854	-1.123	.933

Notes: The *p*-value of Levene's test upper than α=.05, so we can assume equal variances

Table 4 clearly shows that there is no significant difference between two groups in immediate VKT. We can get all of the important information out of the 95% Confidence Interval (CI) for the difference between experimental group and control group. The CI ranges from -1.123 to .933. This means that the actual difference in scores between the groups will lie, with 95% confidence, in this interval. Since zero is found in this confidence interval, we know that we should not reject the null hypothesis. Besides, we can find that the immediate vocabulary knowledge test scores of experimental and control group are not significantly different (p = 0.854, t (82) = -0.184). This means that no matter what kinds of teaching models the subjects are in, they performed similarly in the the immediate vocabulary knowledge test. Although the mean scores of 11.17 and 11.26 seem to be different, no statistical difference happens in the short-term word knowledge gain.

Up to now, the question that what the effect of RfD model on IVA as measured by the immediate vocabulary knowledge test is has been answered. The statistic results of independent-samples t-test show that the subjects significantly acquire the vocabulary knowledge about form-meaning connection in the immediate vocabulary knowledge test under RfD Model. Besides, comparing with RfD model, the traditional teaching model as a control treatment also has a great effect on learners' IVA.

3.2 The effect of RfD model and traditional teaching model on vocabulary retention

As discussed above, the RfD model plays an important role in promoting the development of learners' IVA. In other word, the effect of RfD model on incidental vocabulary knowledge acquisition on form-meaning connections in immediate vocabulary knowledge test analyzed by independent-samples t-test is statistic significant. However, no significant difference was found between the effect of RfD model and traditional teaching model on IVA, nor is the vocabulary retention of two groups clear. Thus, with regard to the effect of RfD model on vocabulary retention and if the effect of RfD model is better than the traditional teaching model, the data should be analyzed further to assess the effect on vocabulary retention

ISSN 2616-5783 Vol.4, Issue 4: 71-81, DOI: 10.25236/AJHSS.2021.040416

by the statistic analyses method of between-group independent-samples t-test, within-group paired-samples t-test and between-group RM ANOVA.

Firstly, to find out the retention effect of RfD model on IVA and whether there was a significant difference between RfD model and traditional teaching model on retention of word knowledge gains, the paired-samples t-test used to respectively explore the vocabulary retention of RfD model and traditional teaching model. The data of descriptive statistics of immediate and delayed vocabulary knowledge test of experimental group under RfD model are displayed in Table 5 and the results of paired-samples t-test of Immediate and delayed knowledge test in experimental group are showed in Table 6. Table 7 is the data results of descriptive statistics of immediate and delayed vocabulary knowledge test in control group. Paired-samples t-test results of immediate and delayed vocabulary knowledge test in control group will be further analyzed based on Table 8.

Table 5 Descriptive Statistics of VKT of EG

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Immediate VKT	11.17	42	2.469	.381
	Delayed VKT	5.26	42	1.449	.224

Table 5 is the descriptive statistic results of immediate vocabulary knowledge test and delayed vocabulary knowledge test in experimental group under RfD model. It shows that the average score of immediate vocabulary knowledge test is 11.17 (sd = 2.469) > 5.26 (sd = 1.449) the average of delayed vocabulary knowledge test in experimental group, which manifests that the mean score of immediate vocabulary knowledge test obviously is higher than that of delayed vocabulary knowledge test for experimental group students.

Table 6 Paired-Samples T-test of VKT of EG

	Mean Difference	t	df	Sig. (2-tailed)	95% Confidence Interval of the Difference	
					Lower	Upper
Immediate-delayed VKT	5.905	19.77	41	.000	5.302	6.508

In Table 6, the paired-samples t-test results show that the immediate vocabulary knowledge test score was significantly different form delayed vocabulary knowledge test score of experimental group students (t (41) = 19.77, p < 0.0001). Inspections of the two tests of experimental group indicated that the average score of students' immediate vocabulary knowledge test (11.17) is significantly higher than that of their delayed vocabulary knowledge test (5.26). The difference between the means is 5.905 points on a 20-point test. Looking at the confidence intervals, we see that 95% CI for the mean difference between the immediate and delayed VKT for experimental group is 5.302, 6.508. This means that the differences between immediate and delayed VKT might be as large as 6.508 and as small as about 5.302, which is much further from zero. Therefore, there is a significant difference between the immediate vocabulary knowledge test scores and delayed vocabulary knowledge scores of experimental group. That is to say, the long-term memory of word knowledge retention decreased for experimental group learners in one month.

Table 7 Descriptive Statistics of VKT of CG

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Immediate VKT	11.26	42	2.264	.349
	Delayed VKT	3.83	42	1.480	.228

Table 7 is the descriptive statistics of immediate vocabulary knowledge test and delayed vocabulary knowledge test in control group under traditional teaching model. It shows that the average score of immediate vocabulary knowledge test is 11.26 (sd =2.264) > 3.83 (sd =1.408) the average of delayed vocabulary knowledge test of control group, which manifests that the mean score of immediate vocabulary knowledge test obviously is higher than that of delayed vocabulary knowledge test for control group students.

Table 8 Paired Samples T-test of VKT of CG

	Mean Difference	t	df	Sig. (2-tailed)	95% Confidence Interval of the Difference	
					Lower	Upper
Immediate-delayed VKT	7.429	25.663	41	.000	6.844	8.013

ISSN 2616-5783 Vol.4, Issue 4: 71-81, DOI: 10.25236/AJHSS.2021.040416

In Table 8, the paired-samples t-test results show that the immediate vocabulary knowledge test score was significantly different form delayed vocabulary knowledge test score of control group students (t (41) = 25.663, $p < 0.0001$). Inspections of the two tests of experimental group indicated that the average score of students' immediate vocabulary knowledge test (11.26) is significantly higher than that of their delayed vocabulary knowledge test (3.83). The difference between the means is 7.429 points on a 20-point test. According to the confidence intervals, we see that 95% CI for the mean difference between the immediate and delayed VKT for control group is 6.844, 8.013. This means that the differences between immediate and delayed VKT might be as large as 8.013and as small as about 6.844, which is much further from zero. Therefore, there is a significant difference between the immediate vocabulary knowledge test scores and delayed vocabulary knowledge scores of control group. That is to say, the long-term memory of word knowledge retention decreased for control group learners in one month.

As the results above evidence, it is clear that both experimental group and control group undergone the degeneration of the long-term memory of vocabulary retention. Subsequently, the comparison results of delayed vocabulary knowledge test scores between experimental group and control analyzed by the method of independent-samples t-test should be regarded as a referential factor to explain the different retention effect of vocabulary knowledge gains between two groups. The data of descriptive statistics of delayed vocabulary knowledge test of experimental group under RfD model and control group under traditional teaching model are illustrated in Table 9 and Table 10.

Table 9 Descriptive Statistics of Delayed VKT

	Group	N	Mean	Std. Deviation	Std. Error Mean
Delayed VKT	EG	42	5.26	1.449	.224
	CG	42	3.83	1.480	.228

In Table 9, the mean of 42 subjects' delayed vocabulary knowledge test scores of experimental group under RfD model is 5.26 (sd=1.449), while the mean score of 42 subjects' delayed vocabulary knowledge test scores of control group under traditional teaching model is 3.83 (sd=1.480) which is lower than experimental group. It claims that RfD model and traditional teaching model affect the vocabulary knowledge retention through delayed vocabulary knowledge test, and subjects acquired more vocabularies in experimental group than that in control group in delayed vocabulary knowledge test. Whether the effect of RfD model on IVA under experimental group is better than that of traditional teaching model under control group requires further statistical analyses.

Table 10 Independent-Samples T-test of Delayed VKT

	Levens' s Test for Equality of Variances		t	df	Sig. (2-tailed)	95% Confidence Interval of the Difference	
	F	Sig.				lower	upper
Delayed VKT	.852	.359	4.469	82	.000	.793	2.064

Notes: The p-value of Levene's test upper than α=.05, so we can assume equal variances

In Table 10, subjects in experimental group under RfD model performed significantly different from those in control group under traditional teaching model on delayed vocabulary knowledge test (p <0.001, t (82) = 4.469). Inspections of the mean scores of two groups indicate that the average delayed vocabulary knowledge test scores of students in experimental group under RfD model is significantly higher than the score of students in control group under traditional teaching model. The difference between the means is 1.429 points on a 20-point test. The CI ranges from .793 to 2.064. This means that the actual difference in scores between the groups exists, with 95% confidence, in this interval. Since zero is not found in this confidence interval, we know that we should reject the null hypothesis. Namely, there is a significant difference between two groups' delayed vocabulary knowledge test scores and learners in experimental group outperformed those learners in control group in keeping the long-term memory of vocabulary knowledge gains. It is concluded that the retention effect of vocabulary knowledge of RfD model is better than that of traditional teaching model.

Previous findings has shown that the results of t-tests of two groups' vocabulary knowledge tests, thus, the 2×2 repeated measures ANOVA was run to find out whether there was any main effect and interaction effects of time variables (immediate moment and delayed moment) and group variables (experimental group and control group). The instrument of R is used to carry out statistical analyses.

ISSN 2616-5783 Vol.4, Issue 4: 71-81, DOI: 10.25236/AJHSS.2021.040416

Table 11 Descriptive Statistics of VKT of Two Groups

Group	Test time	Vocabulary test (Total=20)
EG	Immediate	11.17(2.469)
	Delayed	5.26(1.449)
CG	Immediate	11.26(2.264)
	Delayed	3.83(1.480)

Table 11 presents the descriptive statistics of both the vocabulary knowledge tests for two groups. It can be seen from Table 11 that the scores for vocabulary knowledge tests of both groups were very close in the immediate test (11.17 vs. 11.26). But obvious discrepancies emerged in the test of one month later. Though the total scores of both groups declined, the decrease of the control group seemed more pronounced (5.26 vs. 3.83).

Table 12 The Repeated-Measures ANOVA of VKT

Greenhouse-Geisser	Type II Sum of Squares	df	F	Sig.	Partial Eta Squared	Observed Power
Time	1866.667	1	1027.621	.000	.926	1.000
Group	18.667	1	3.143	.080	.037	.418
Time*Group	24.381	1	13.422	.000	.141	.952

In order to test whether there were significant differences in the two vocabulary knowledge tests and whether time exerted significant effect in both groups, 2 × 2 repeated-measures ANOVA were carried out in R (see Table 12). The Mauchly test indicated that the sphericity assumption had been violated for the differences in degrees of freedom. Because Mauchly's test for sphericity was not statistical, we might use a correction to degrees of freedom and it was statistical using the Greenhouse-Geisser correction. Table 12 was the results of Greenhouse-Geisser correction in stead of Sphericity assumed results. The group was treated as a between-subject factor (experimental group vs. control group) and time (immediate vs. delayed) as a within-subject factor. The result indicated that group had no main effect (F (1, 82) = 3.143, p = .08, η^2= .037) which meant that if the effect of time held constant, there were no differences between the experimental and control group. But time had main effect (F (1, 82) = 1027.621, p < 0.0001, η^2= .141). The results of the delayed vocabulary knowledge test were significantly worse than the immediate vocabulary tests. But more importantly, a time and group interaction were found (F (1, 82) = 13.422, p< 0.0001, η^2= .926). Time exerted much stronger effects on the control group than on the experimental group. This can be clearly seen in Figure 1.

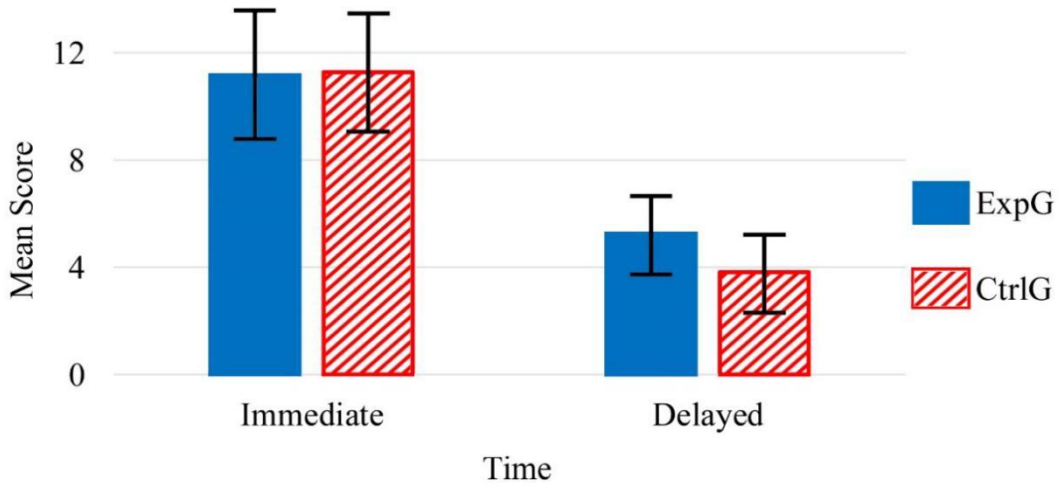

Figure 1 VKT of EG and CG

From Figure 1, it can be seen that, although the experimental group and the control group achieved quite similar results in the immediate vocabulary tests, the experimental group performed much better than the control group in the delayed vocabulary test in one month (no error bar overlap between the two groups). It can be confirmed that the retention effect of RfD model is much better than that of traditional teaching model on incidental vocabulary acquisition.

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4. Conclusion

This study focused on the effect of RfD model on IVA. Thus, two different treatment conditions were set up to verify if the RfD model with reading and discussion made a better influence than the traditional teaching model with only reading on IVA. The overall result of the present research study is that RfD model significantly affects learners' incidental word knowledge gains. Compared with the traditional teaching model, in the short-term, the effect of RfD model on incidental vocabulary acquisition and text comprehension is approximately similar, but in the long-term, the retention effect of RfD overrides the effect of the traditional teaching model.

The major goal of this study was to assess the effect of RfD model on IVA and retention by comparing the effect the traditional teaching model yielded. With respect to initial target word learning, especially the target words are pseudo-words and with a same frequency, the word knowledge gains of lexical form-meaning connection are almost equal between RfD model and the traditional teaching model. Learners can acquire vocabulary knowledge incidentally not only under RfD model but also under the traditional teaching model. Both models promote the learners' vocabulary acquisition in the short-term indicates that L2 reading as an important language input helps incidentally acquiring vocabulary (Hulstijn, 2001). The data analysis of delayed VKT revealed there is a significant difference between RfD model and the traditional teaching model on the retention of word knowledge. Besides, the retention effect of RfD model is better than that of the traditional teaching model. The previous result of the effect of RfD model and the traditional teaching model on word knowledge gain in immediate VKT are almost similar. In contrast, in the delayed VKT, the retention effects of vocabulary knowledge of learners are great different. Although over time the word knowledge retention tends to fade in experimental and the control group, students under RfD model and the traditional teaching model still reveal more word knowledge gain. Yet, as discussed with respect to previous result, learners in RfD model did much better than those in the traditional teaching model. Moreover, it can be assumed that word knowledge would be relatively decreased in the long-term period because Nagy (1987) proved "decline in retention is sharpest immediately after learning and becomes increasingly gradual".

In sum, the RfD model and the traditional teaching model also affect the learners' IVA. The effects of two groups on word knowledge retention are significantly different in the delayed test. The retention effect of word knowledge yielded by RfD model was better than that yielded by traditional teaching model in the long-term. This study has a valuable significance. Theoretically, this study from the perspectives of reading and discussion emphasized by RfD model is a novel research method to investigate the effect on IVA, which makes contributions to enrich the theories of experimental study on IVA. Practically, the exploration of the effect of the RfD model on IVA may benefit English learners and teachers in their future learning and teaching. For learners, they can improve the word knowledge gains by this method of RfD model. For teachers, RfD model is an effective way to reform the traditional teaching methods which can be used to cultivate students' English language competence by integration of reading and oral interaction in communicative classroom teaching context and the major findings of the effect of RfD model on IVA and can provide reference for FL classroom teaching.

Although much preparation has been made in this study, there still exits some limitations. Firstly, the sample size of experiment subjects is relatively small. For verifying the reliability of the experimental results, enlarging the number of subjects and selecting students regarded as subjects from different colleges are the important experimental factor what should be improved in the further study. Secondly, the tests of the present study consisting of vocabulary tests and reading content test which just consider the effect of RfD model on IVA is another limitation. Other English competences should be taken into consideration in the further study.

References

[1] Al-Hejin, B. (2004). Attention and awareness: evidence from cognitive and second language acquisition Research. Working Papers in TESOL & Applied Linguistics, 4, 1-22.
[2] Atkinson, D. (2011). Alternative Approaches to Second Language Acquisition. Routledge.
[3] Brown, H. D. (2002). Principles of Language Learning and Teaching. Beijing: Foreign Language Teaching and Research Press.
[4] Coady, J. & Huckin, J. (2001). Second Language vocabulary acquisition. Shanghai: Shanghai Foreign Language Education Press.
[5] DeKeyser, R. M. (2014). Age effects in second language learning. In S. Gass & A. Mackey. The Routledge Handbook of Second Language Acquisition[C]. London & New York: Routledge. 442-460.

ISSN 2616-5783 Vol.4, Issue 4: 71-81, DOI: 10.25236/AJHSS.2021.040416

[6] Ellis, R., Basturkmen, H., & Loewen, S. (2001). Learner Uptake in Communicative ESL lessons. Language Learning, 51(2), 281-318.
[7] Gass, S. M. & Mackey, A. (2007). Input, interaction, and output in second language acquisition. In B. VanPatten & J. Williams (Ed.), Theories in second language acquisition: An introduction (pp. 175-199). Mahwah, NJ: Lawrence Erlbaum.
[8] Harmer, J. (2000). How to Teach English. Foreign Language Teaching and Research Press.
[9] Hatch, E. & C. Brown. (2001) Vocabulary, Semantics and Language Education. Cambridge Cambridge University Press.
[10] Hulstijn. (2003). Incidental and Intentional Learning. The Handbook of Second Language Acquisition.
[11] Izumi, S. (2002). Output, Input enhancement, and the noticing hypothesis: an experimental study on ESL relativization. Studies in Second Language Acquisition, 24, 541-577.
[12] Izumi, S. & Bigelow, M. (2000). Does output promote noticing and second language acquisition? TESOL Quarterly, 34 (2), 239-278.
[13] Jakonen, T. & Morton, T. (2015). Epistemic search sequences in peer interaction in a content-based language classroom. Applied Linguistics, 36(1): 73-94.
[14] Lantolf, J. P. (2006). Sociocultural theory and second language development: State-of-the-art. Studies in Second Language Acquisition, 28(1): 67-109.
[15] Laufer, B. & Hulstijin, J. H. (2001). Incidental vocabulary acquisition in a second language: The construct of task-induced involvement. Applied Linguistics (22): 1-26.
[16] Laufer, B. (1990). Sequence and order in the development of L2 lexis: Some evidence form lexical confusions. Applied Linguistics, 11,281-296.
[17] Laufer, B. & Hulstijn, J. H. (2001). Incidental Vocabulary Acquisition in a Second Language: The Construct of Task-induced Involvement. Applied Linguistics, 2001 (1): 1-26.
[18] Min, H. T. (2008). EFL vocabulary acquisition and retention: Reading plus vocabulary enhancement activities and narrow reading. Language Learning, 58, 73-115.
[19] Nunan, D. (2001). The Learner-Centered Curriculum: A Study in Second Language Teaching. Shanghai Foreign Language Education Press.
[20] Pellicer Sanchez. (2016). Incidental L2 vocabulary acquisition from and while reading: An Eye-tracking study[J]. Studies in Second Language Acquisition (38): 97-130.
[21] Plowman, B. (2003). The difference in vocabulary acquisition for grade one students using Shared reading or guided reading. Retrieved August 9, 2013 from university of windsorhttp://scholar,uwindsor.ca/etd.
[22] Richard, J. (2003). The role of vocabulary teaching. TESOL Quarterly,10(1),77-89.
[23] Robinson, P. (1995). Review article: attention, memory, and the noticing hypothesis. Language Learning, 45, 283-331.
[24] Rott, S. (2015). The Effect of Exposure Frequency on Intermediate Language Learners' Incidental Vocabulary Acquisition and Retention through Reading. Studies in Second Language Acquisition, 21, 589-619.
[25] Tarone, E. (2015). Second language acquisition in applied linguistics: 1925-2015 and beyond. Applied Linguistics (4):444-453.
[26] Tricia Hedge. (2000). Teaching and Learning in the Language Classroom. Oxford: Oxford University Press.
[27] Tsui, A. B. M. & Tollefson, J. W. (2007). Language policy and the construction of national cultural identity. London: Lawrence Erlbaum Associates (18): 1-21.
[28] VanPatten, B. (2002). Processing instruction: an update. Language Learning, 52, 755-803.
[29] Vidal, K. (2003). Academic listening: A source of vocabulary acquisition? Applied Linguistics, 24(1), 56-89.
[30] Wu Shiyu, Huang Shaoqiang (2018). College English Teaching, Why Stick To "Reading and Discussion? Contemporary Foreign Language Studies, (2), 9-14.