

The Implementation of Word Study Wall in an Online English Word Memorization Class

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Abstract—With the advancement of the economy, technology promotes online teaching, and learning has become one of the common features in the educational field. Meanwhile, the dramatic expansion of the online environment provides opportunities for more learners, including second language learners. A greater command of vocabulary improves students' learning capacity, and word acquisition and development play a critical role in learning. Furthermore, the Word Wall is an effective tool to improve students' knowledge of words, which works for a wide range of age groups. Therefore, this study is going to use the Word Wall as an intervention to examine whether it can bring some memorization changes in an online English language class for a second language learner based on the word morphology method. The participant will take ten courses in the experiment as it plans. The findings show that the Word Wall activity plays a slight role in improving word memorizing, but it does affect instant memorization. If longer periods and more comprehensive designs of research can be applied, it is expected to have more value.

Keywords—Second language acquisition, word morphology, word memorization, the Word Wall.

I. INTRODUCTION

WITH the advancement of technology, the dramatic expansion of the online environment provides opportunities for a variety of learners [1], especially for second language learners. As the prerequisite of commanding a language is to expand vocabulary [2], one kind of course is to assist students to acquire more English vocabulary by using the “word morphology” learning method, which is “the study of the structure of words as combinations of smaller units of meaning within words” [3]. Although word morphology does provide students with skills for analyzing the meaning of words, it is not enough for them to deeply memorize and command a large amount of English vocabulary, especially when the new-encountered vocabulary appears. More supports are needed for students to experience a better learning process. In addition, teachers who are responsible for educating this content need a more effective and efficient strategy to enhance students' word learning [4]. Therefore, this project aims to find a meaningful intervention to strengthen students' word memorization of English vocabulary based on word morphology learning.

II. LITERATURE REVIEW

The recognition of language learning has given rise to the importance of vocabulary learning [2]. For second language

learners, vocabulary is “a principle contributor to comprehension, fluency, and achievement” [5, p.528], which fundamentally affects the outcome of 70-80% of comprehension [5]. If the native English speakers know about 20,000 word families or 70,000 words, second language learners only know a fraction of them [6]. As meaningful communications rely largely on rich vocabulary [7], it is indispensable for students to learn vocabulary systematically [2]. However, in the past, “traditional vocabulary instruction for many teachers involves having students look words up in the dictionary, write definitions, and use words in sentences” [7, p.528]. This ineffective and inefficient means not only neglect the research and theories behind the word learning [5], but also ignore the difficulty of adolescents learning.

A. Adolescents Learning

The critical period hypothesis, put forward by Penfield and Roberts (1959) [8], is about the distinction of foreign language achievement in different ages [9]. Lenneberg later developed this to second language acquisition in 1967 [9]. They proposed that the early bilinguals acquire the second language more proficiently than late ones in that age-related loss of ability will be cumulative under the influences of neurological, social-psychological, and input differences [10], [9]. Due to the real situation of teaching adolescents, it is critical for the instructor to pay attention to the teaching strategy. As one of the adult learning principles is more willing to learn what is meaningful to them, the methods which can optimize their learning effectively become key [11]. For them, vocabulary acquisition carries a significant role in typical language learners [12]. It requires the instructor not only to deliver particular words, but also to apply strategies and techniques to deepen their word knowledgeability [12]. Thus, the word morphology that meets the requirement will be implemented and applied.

B. Word Morphology

Word morphology is to classify the units in terms of their grammatical meanings and “the way that they associate properties with these units [6, p.531]”. The comprehension of the morphology of words is a capacity of examining “the form and structure of words in a language” [11, p.3]. The word learning by affixes and roots is of great significance in vocabulary skills, which requires students to equip word analysis ability to define new words [15], and assists to analyze the meanings of prior-unknown words [14]. Among loanwords, 80% of them are from Latin and Greek origins. Moreover, 12 Latin and 2 Greek roots can combine with 20 common words with generating 100,000 expanding words

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[14]. It means that when students learn a prefix, root, or suffix, a wide range of words is unlocked [5]. Therefore, word morphology is an amazingly efficient learning strategy for language learners to transfer from ponderous reciting to take apart and reconstruct.

C. The Word Wall

One strategy for instruction is known as Word Wall that contains individualized themes, which is able to create columns and match the demand of word morphology. For Word Wall, educators define it in different ways [16]. Mainly, it is a wall that lists a variety of words to expand students' knowledge of how language works, which is essential to their academic success [16], [17]. Word Wall is a dynamic display because teachers and students can add or combine words on it [18].

Reference [14] puts this into practice as an instructional strategy for teaching word morphology. In general, there are four steps. First, a Word Study notebook is divided into three sections, listing "prefixes", "roots", and "suffixes" with different colors [14]. Then, a wall is created for students to add what they discover and to review very often [14]. After students are familiar with those affixes and roots, teachers start games and races for them to practice "creating", understanding, and evaluating new words [14]. Moreover, [17] proposes that Word Wall can be implemented in multiple-meaning words, affixes, and root-words related to the understanding of core ideas. Some Spanish-English cognates take effects through Word Wall as well if words have similar origins, meanings, spellings, and pronunciations from two different languages [17]. This activity scaffolds visual connections between words, which improves word analysis skills for students to understand sets of words [16]. Reference [19] implements the word wall to assist students to build word recognition and remember connections between words, which is practical for improving students reading literacy and fluency [19].

D. Purpose of Study

Although second language students desire to command English vocabularies as many as possible, only learning by rhyming and phonetic patterns are completely not qualified to strongly memorize words. In order to solve the problem, the structural analysis of word morphology is supposed to be brought. This model is "affix-based" and "root-based", whose forms are "built" or "derived" [13]. Due to the different way of recognizing English vocabulary, so [20] advocates that students would better have morphological awareness for their learning achievement, and they compared and analyzed 16 studies to evidence its importance, which requires students to have keen perceptions when there are affixes in the words.

Meanwhile, Word Wall is an activity intervention that infuses word morphology with word memorization in the online learning environment. This activity comprises word morphology theory, interactive instruction, and technology-based elements to improve students' memorization. They cannot only know how words are explained, but also achieve

why words are created in their ways. It means that this activity extends the possibility of students' effectiveness in learning by word morphology. Moreover, this activity involves many benefits. First, it is timesaving. The Word Wall method does not require students to rote, which costs time to listen to phonetic transcription, follow the pronunciation, and scratch on the draft. Learners can separate words and combine them anytime and anywhere they are available by following the instructions. Second, it applies to cross-curriculums. The method is a learning skill that entails students taking advantage of it in diverse subjects [14]. Third, it mobilizes student's prior knowledge. Teaching word morphology is a building-up task instead of a fresh start for learners. They should have gained amounts of fundamental words for basic understanding and comprehension [14]. Researchers also examine the effects of vocabularies and reading comprehension on assisting students learning [15]. Thus, the research question is to find changes by using a meaningful intervention to strengthen students' word memorization of English vocabulary based on word morphology learning.

III. METHODS

The research utilizes sociocultural theory as the theoretical framework. Sociocultural theory, coined by Vygotsky (1978) [21], emphasizes the role of social intervention in the development of thinking [22]. According to Vygotsky (1978) [21], effective learning happens when learners are in their zone of proximal development (ZPD), which is defined as "the distance between the actual development as determined through problem solving under adult guidance or in collaboration with more capable peers" [21, p.89]. The present study is about how student word memorization changes after implementing a Word Wall in an online English language class for a Chinese student. A Word Wall activity uses scaffolding to support students' knowledge acquisition and memorization improvement in words morphology learning. The one in this article is applied to help word memorization, and it is adjusted from Ganz's (2008) [14] a series of instructional strategies for teaching word morphology.

Participant

For this study, the participant is a Chinese student. She is a junior at the undergraduate level, who is studying in China now. All the courses she is taking are in Chinese. Usually, she spends 1.5 to 2 hours every week on learning English at school herself.

Materials

The materials are the vocabularies which contain diverse affixes. Due to the non-importance of the exact words, the research only lists the affixes in each course.

Procedures

The schedule is three times a week. Ten online courses will be taken by the participant via Zoom as a complete program. Basically, the test will be finished in three weeks or so. Even

though the content is affix-oriented, the roots and suffixes are included in the specific vocabulary.

TABLE I
PARTICIPANT'S LEARNING CONTENTS IN TEN COURSES

Course	1st	2nd	3rd	4th	5th
Affixes	Re- Un- Ex-	Act- Ceed/cede/cess- Cur/car-	Voc/vok- Claim- Fus-	De- Out- Inter-	Man/manu- Scribe- Point-
Course	6th	7th	8th	9th	10th
Affixes	Sist/stit- Sed/sid- Spir-	Pre/pro/pri- Fore- Per-	Sol- Mono- Unit- Di/bi-	Sens- Vis- Spec-	Review

Courses are divided into four sections. The first section includes the first three courses. In this section, the word morphology learning method will be utilized. The student starts learning English language vocabulary through understanding affixes and roots.

In the second section, from the fourth course to the sixth, Word Wall activity will be added. It requires a student to not only learn English words based on word morphology, but also participate in this activity to help emphasize word memorization. For Word Wall, a paper is prepared listing "prefixes", "roots", and "suffixes" in three different columns. Once the student learns a word, she will add "prefixes", "roots", and "suffixes" in the corresponding column. The operations will be repeated. Next, the instructor leads and inspires the student to pick "prefixes", "roots", and "suffixes" to reconstruct and create new words no matter they are real or not. This process allows the student to practice the understanding of word combinations. Except for reorganizing new vocabularies, the student is asked to speak out the meaning of those words in terms of their "prefixes", "roots", or "suffixes". Then, looking up the dictionary to check out which are real words and memorizing them are the last steps. These three courses are for the student to be familiar with this activity.

The seventh, eighth, and ninth courses belong to the third section. It is to repeat the second section in that being proficient can optimize the data.

The last section is the tenth course. The instructor uses this last course because helping the student review all the vocabulary in this learning process will reinforce her memorization. This step is not only value-laden in the research, but it generalizes the effectiveness of learning.

Measurements

As the Word Wall activity is an intervention, the study collects data from the courses without the activity (from 1st to 3rd courses) and the courses with the activity (from 7th to 9th courses). Thus, the data collection between pre-intervention and post-intervention is crucial. Before the intervention, the number of how many vocabularies has not been memorized by the student is recorded twice. For example, in the first course, after teaching a variety of words, the instructor will collect the number of how many words' meanings are understood and memorized correctly by the student. Then, at the beginning of

the next course, the same test will be done again to record how many words are still memorized in the student's brain. Therefore, the baseline data are mainly from the first to the third courses. After using the Word Wall activity, the instructor will do the same collecting process after the Word Wall activity. For instance, at the end of the seventh course, the instructor examines vocabulary after the interactions with the student in Word Wall. In the meanwhile, the correctness will be recorded. Next, before starting the new knowledge in the eighth course, all the previous words in the last course will be checked out and the correctness will be collected.

Due to the difference in the number of words in each course, it is also necessary to record how many new vocabularies are taught to the student in every course. Therefore, the sum of the words in each course (defined as S), the total of memorized words in the current course (defined as A), and the number of memorized words in the next course (defined as B) are all collected and ready for analysis. The formula (R) is to use B to subtract A, and then the result divides S [$R = (B - A) / S$]. And what we get is the effectiveness of this learning intervention. Taking two courses as examples, in the 7th course, the influence of the intervention will be $(19 - 17) / 22 = 9.09\%$. The result is positive, which means that the intervention takes effects. In the 8th course, the influence is $(22 - 24) / 24 = -8.33\%$. It means that the intervention does not help significantly at that moment because the result is negative. Therefore, when the number is beyond or equal to zero, it elaborates the strategy plays a part, which implies that student is able to memorize more words than before. On the contrary, when the number is under zero, it means that the method does not work or has minimal influence.

In order to rich the data, the student is asked to give feedback after every three courses to talk about their feelings of the word morphology, Word Wall activity, and her achievements. The detailed feedback is in the appendix.

IV. RESULT

Measurements

The data of how many vocabularies were learned in each course and how many words were not memorized from 10 courses were collected and analyzed. The tenth course was a review, so its data were not included.

TABLE II
THE RESULT OF PARTICIPANT'S CORRECTION RATE

Course	1st	2nd	3rd	4th	5th	6th	7th	8th	9th
Sum	27	18	17	22	18	17	22	24	21
A	24	13	14	18	14	15	17	24	21
B	24	13	11	19	18	13	19	22	18
Rate	0	0	-17.65%	4.55%	22.22%	-11.76%	9.09%	-8.33%	-14.29%

The first line was the sequence of the courses and the total number of vocabulary words were demonstrated in the second line. The third and the fourth lines were the correctness of the end of each course and the beginning of the next course. The last line displayed the memorization ratio of the contents.

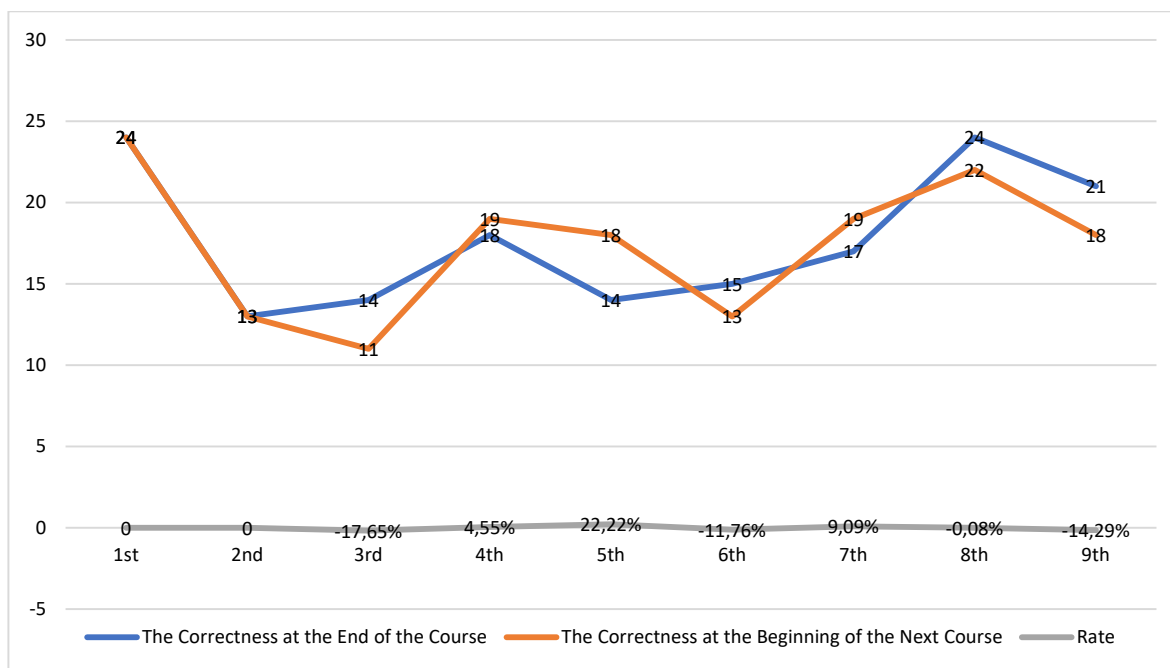


Fig. 1 The Result of Participant's Correction Rate

The total amount of vocabulary in each course was from 17 to 27. The mean in each course was 20.7, which meant that the student can learn about 20-21 words in each course. However, it seemed that the correctness was not relevant to the number of words. Although many factors influenced student's memorization, the general correctness was increased, especially right after using the intervention. Among those ten courses, the first two courses displayed the same memorization and the correctness rate. Two data were salient that in the last two courses, the student got 100% correctness ratios in the tests right after the intervention at the end of the courses. Four courses had negative ratios which meant the improvement of the student's memorization, while three courses had positive ratios, interpreting the decrease in memorization. The study only picked the first three courses' data and the last three courses' data as comparisons, the consequences were that two negative rates to one negative rate.

V. DISCUSSION

The study was to examine whether the participant's memorization of the vocabulary changes after using a Word Wall intervention based on word morphology learning. The changes were not as large as they were expected, even though Ganz (2008) [14] uses Word Wall as an imperative instructional strategy for teaching word morphology. It is true that student's memorization records fluctuate after the intervention is added. However, memorization was affected by a wide range of factors, such as pressure, familiarity, fluency, and possibly extra time in learning after the courses.

Even though the intervention made slight differences, there was one surprisingly unexpected finding. After utilizing the Word Wall intervention proficiently, in the 8th and the 9th

courses, the student got full scores in the tests right after the interactions at the end of those two courses (in the 8th and 9th courses, there were 24 and 21 words respectively. The participant's correctness is 100%). It meant that the Word Wall activity could deepen learner's understanding of word morphology and emphasize learner's immediate memorization in the vocabulary. It is a practical tool to enhance learners' knowledge of words [16]. Therefore, Word Wall activity is recommended in teaching and learning if it is possible to implement in a long learning period.

The student's feedback in the appendix asserts that: "The biggest feeling for me is that English words are really amazing. One affix will derive many words, and different affixes will represent different parts of speech and different meanings. Even the pronunciation of the same word has changed with different parts of speech. I think this method is very good. I can learn a lot of words through a root and an affix, also memorizing words will not be boring". Thus, word morphology plays an effective and efficient role in word acquisition. It resonates Ganz's (2008) [14] conclusion that the application of teaching word morphology is of great significant. Identifying unknown vocabulary with prefixes and root words takes effects for students [15].

VI. LIMITATIONS AND FUTURE RESEARCH

First, the participant took the courses in the library. She was not isolated in a quiet and comfortable room. Other people's actions, such as talking, walking, and moving, greatly impacted how much concentration she could devote to the courses, which also indirectly made differences in her knowledge acquisition. So, it is suggested that learners take courses in an uninterrupted environment to help keep their concentration in the future research. In the meanwhile, it is

needed to expand and collect the potential factors that influence participants English word study.

Second, due to the participant learning for a Chinese Teaching Certificate, it was hard to evaluate how much extra time she put into this research. In the courses, she mentioned that she did not have regular English courses in the school and her time in learning English was not stable. How often she reviewed the vocabulary was not clarified, which probably contributed to different test results. If the student reviewed the words two days before the next course, she probably would have a lower correctness than reviewing them two hours before. It is hard to tell, so in the future study, it is recommended that researchers record how many hours the participants spend on English learning and word memorizing, how often the participants review words as well as when the participants review them before next course.

Third, there is only one participant in the present study, so students' interactions during the courses are lacking. It is difficult to predict whether the interactions between students assist to deepen the word memorizing or whether an active atmosphere in the courses is helpful in the online learning environment. To summarize, it is recommended to gather more students in the research and pay attention to the relationship of the interactions and Word Wall activity in word memorization.

Fourth, the duration for this research is only 10 courses in 3 weeks. It is quite short to fully examine the effectiveness. Therefore, it is necessary to design a more comprehensive curriculum for a longer learning process. More and longer researches are needed in the future to test whether Word Wall activity can play a larger role in word memorization or not.

APPENDIX A

Participant's Feedback of Self-statement

The first three class respectively talked about re- un- ex- act- ex- ceed/cede/cess- cur/cer- voc/vok- claim- fus- word formation. Through these three lessons, I have understood the composition of many English words and also mastered the skills of memorizing words. Previously, I learned some simple affix roots, which can distinguish his part of speech, but now what I learn is that I can guess his meaning. The biggest feeling for me is that English words are really amazing. One affix will derive many words, and different affixes will represent different parts of speech and different meanings. Even the pronunciation of the same word has changed with different parts of speech. I think this method is very good. I can learn a lot of words through a root and an affix, also memorizing words will not be boring. It is no longer through phonetic symbol mechanical memory. This method is impressive. When we get a reading or translation, we can guess the general meaning of the word you don't know in this way.

In the second stage, we switched to the method of learning the wall after class. I think the learning wall is more effective than just reviewing the words we have

learned in this lesson. Connect the prefix roots and suffixes of this lesson to group words by ourselves so that we can not only memorize the words learned in class, but also combine some new words by ourselves which will give us a deeper impression. One of the biggest misunderstandings I have in these three lessons is that the prefix always takes him as the meaning of the words I have learned before, such as as, ad and etc. Some cultural knowledge will also be mentioned in class, allowing me to understand some American culture, and get a preliminary understanding of several major software programs in the United States and the geographical location of each continent.

This week's learning is still through the word wall method, but the application is more proficient, and I gradually discovered a lot of new words, which makes me feel very fulfilled and impressed. After learning so many affix roots, and now when I meet a strange word with these root affixes, I can guess what it means through the knowledge I have learned. I have learned a lot, and I don't have to memorize the meaning of the word mechanically.

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