

LETTER TO THE EDITOR

Lexical Cognition Ecology Neuroscience from the Perspective of Cognitive Linguistics

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Cognitive linguistics is a new method of language research. It is not only a single language theory, but also a research paradigm. It is a general term for many cognitive language theories. The cognitive linguistic regards the daily experience of people as the basis of language use and focuses on the inextricable link between language and general cognitive ability. In order to study the lexical cognition neuroscience from the perspective of cognitive linguistics, the experiment is carried out to test the lexical cognitive neuroscience. By pre-testing and post-testing the essays of the experimental and control students, lexical cognitive neuroscience can effectively improve the English writing level of secondary vocational students.

I Introduction

Yonghong Li, Zhouchun He in “Environmental Adaptation Theory and application in Standard Language Competence Model Ekoloji”, 2019, Issue 107, Pages: 2779-2782, Article No: e107310 mention: With the development of world economic integration, English, as a major language of communication, has become the second language of learning in China (Li and He 2019). However, due to the differences between China’s education system and English education, the cultivation of college students’ English ability in China is not practical. Obtains the proportion of the main evaluation criteria of college English standard language competence review in China. After the change of English education environment, the evaluation indexes of college English standard language competence are the oral ability, reading ability, comprehension and application ability.

Cognitive linguistics is a sub-discipline of linguistics. It is based on the second generation of cognitive science and experiential philosophy, and is generated based on the opposition to mainstream linguistic (Brenda 2017) and formed in the late 1980s until the 1990s. Cognitive linguistics involves a variety of disciplines such as artificial intelligence, linguistics, psychology, and systems theory. It focuses on the concept of generative linguistics (Torres-Martínez 2015) and proposes that the creation, learning, and use of language must basically be explained through human cognition because cognitive ability is the foundation of human knowledge.

II Methods

This study followed the law of students’ cognitive development and Lewis’s lexical teaching theory, and designed the lexical teaching mode of “input lexical chunks-internal lexical chunks-output lexical chunks” to teach the writing for experimental students (Daly et al. 2016). The purpose of the input lexical chunks was to obtain the lexical material for use in writing (Willits et al. 2015), the basic principle of input lexical chunks was that the

selected material should be suitable to the cognitive level of the vocational students and should be in accordance with the requirements of the curriculum standards for secondary vocational students (Mu and Matsuda 2016).

III Results

Table 1. Comparison of “English proficiency test score” between experimental class and control class (N=43)

Class and grade	Average score	The highest score	Lowest mark	Standard deviation	T value	P values
Experimental classes	42.70	86	6	20.075	0.313	0.755
That in comparative classes	44.07	90	9	20.631		

Table 1 showed that the average pre-test scores of students in two classes did not reach the passing line, which reflected that the average English level of students in two classes did not reach the level that the first-year students should have reached. The average score of the control class was 44.07, and that of the experimental classes was 42.40. The scores of the two classes were very close, and the difference between the two was only 1.37. It can be seen from the highest score and the lowest score that the highest score in the control class was 90, and the lowest score was 9; the highest score in the experimental class was 86, and the lowest score was 6. The standard deviation of the two classes was almost the same, that of the control class was 20.631, and that of the experimental class was 20.075, which indicated that the internal dispersion of the English proficiency of students in the two classes was roughly the same. The results of T test was, $t=0.313$, $p=0.755$ ($P>0.05$), indicating that students in the experimental class and the control class had the same English level before the experiment, and there was no significant difference (Pan et al. 2015).

The average pre-test scores of the English essays of the two classes were comparable. The average score of the experimental class was 41.51, and the average score of the control class was 43.16. The average score of the control class was 1.65 points higher than that of the experimental class. From the highest score and the lowest score, the highest score of the pre-test in the experimental class was 85, and the lowest score was 0 (the examination paper was blank); the highest score of the pre-test in the control class was 88, and the lowest score was 0. The internal dispersion of the English essay scores of these two classes was also roughly the same, and the standard deviation was 21.518 and 20.861, respectively, a difference of 0.657. The results of T test showed that $t=0.361$, $p=0.719$ ($p>0.05$), indicating that the writing level of the experimental class and the control class before the experiment was equivalent, there was no significant difference, and teaching experiments could be conducted in these two classes. After the experiment, the average score of the post-test of the students in the experimental class (53.84) was 12.33 higher than that before the experiment (41.51), and the average score of the post-test of the students in the control class (46.19) was also higher than that before the experiment (43.16) by 3.03, and the increase of the experimental class was 9.3 higher than the control class. From the highest score and the lowest score, the highest score of the post-test of students in the experimental class was 90. The lowest score was still 0 (the entire examination paper was blank). The highest score of the post-test of students in the control class was 86, and the lowest score was 0. From the results of T test, $t(1,84)=-2.143$, $p=0.035$ ($p<0.05$), indicating that the overall level of English writing between the experimental class and the control class has begun to show significant differences after the experiment. Analysis of the number of lexical chunks used by students in the two classes before and after the experiment. The average number of lexical chunks used by students in the experimental class was 3.93, and the average number

of lexical chunks used by the students in the control class was 4.14. The average number of lexical chunks used by the students in the control class was higher than that of the experimental class. The results of the independent sample T test showed that $t=0.534$ and $p=0.595$ ($P>0.05$), indicating that there was no significant difference in the usage level of lexical chunks between the two classes before the experiment.

After the experiment, the average number of lexical chunks used by students in the experimental class was increased from 3.93 to 5.35, with an increase of 1.42. The average number of lexical chunks used by students in the control class was increased from 4.14 to 4.44, with an increase of 0.3. The increase of the experimental class was greater than the control class by 1.12. From the highest value change of the number of used lexical chunks, the highest value of the experimental class was increased from 8 to 12, which increased by 4. The highest value of the control class was increased from 8 to 9, which only increased by 1. From the results of the independent sample T test, $t(1,84)=-2.426$, $p=0.017$ ($p<0.05$), indicating that the average number of lexical chunks used by students in the experimental class was improved significantly compared to the students in the control class through lexical cognitive neuroscience teaching for a semester.

It was not difficult to see that the average number of lexical chunks used in the essays written by students in the experimental class was higher than the average number of lexical chunks used in the pre-test (higher than 1.42), indicating that after the cognitive neuroscience teaching experiment, the average number of used lexical chunks after the experiment had a certain improvement than before the experiment. Standard deviation of the post-test was slightly larger, which indicated that the distribution of lexical chunks usage post-test was slightly larger, and the distribution of lexical chunks usage was slightly larger than the distribution of the pre-test.

The correlation coefficient of the lexical chunks usage before and after the experiment in the experimental class was 0.835, which was relatively high; the relevant significance level was $0.000<0.05$, indicating that the two were significantly correlated, and the paired sample test can be performed.

The average of the difference between the two variables was -1.419, and the standard error was 0.164, the 95% confidence interval for the difference was -1.749 to -1.088, the t value was -8.660, the degree of freedom was 42, the significance level $p = 0.000<0.05$. It was indicated that there was a significant difference between the lexical chunks usage of the pre-test and post-test in the experimental class under the 95% confidence level.

Before the experiment, the average number of valid words in the experimental class and the control class was very close, and the average value of the experimental class was 51.21. The average value of the control class was 52.60, which was 1.39 higher than that of the experimental class. From the highest value and the lowest value of the effective number of words used in the essay, the maximum number of valid words in the essay of the experimental class can reach 117, the highest value of valid words in the essay of the control class can reach 124, and that of the control class was higher than that of the experimental class. The minimum number of valid words in the essays written by the students in the control class was zero, that is, the entire examination paper was blank. From the results of the independent sample test, $t=0.288$, $p=0.774$ ($p>0.05$), indicating that there was no significant difference between the effective number of words used in the essay of the two classes before the experiment, that is, at the beginning of the experiment. The fluency of writing for students in each class was almost at the same level.

After the experiment, in the post-testing of the two classes, in addition to the minimum value, the mean and maximum number of valid words were improved. The average value of the experimental class reached 63.74, and the average value of the control class reached 54.12. The average value of the experimental class was higher than the control class by 9.62; the maximum value of the experimental class was increased to 146, which was 29 more than the original, and the maximum value of the control class also reached 128, which was 4 more than the original. From the results of independent sample test, $t(1,84)=-2.029$, $p=0.046$ ($p<0.05$), indicating that the fluency of writing of students in the experimental and control classes at this time has been significantly different, which reflected the

fact that the lexical cognitive neuroscience teaching method was more effective than the traditional teaching method in improving the fluency of students' writing.

In the early, middle and late stages of the experimental research, the lexical test was carried out for students in the experimental class and the control class. The test content was the lexical knowledge of three modules. The questions include the phrase translation, the word filling, and the completion of the sentence. The score was 50 points and the test time was 30 minutes.

According to the data, the difference between each question type in the experimental class and the control class was +0.5 points, and the total score difference was -0.5 points, which can be regarded as basically the same. After the same content, the same progress, and different teaching methods, the test results in the middle of the study changed. The score of the experimental class was 5 points higher than the control class, and the difference between the phrase translation groups was the highest, and the score of the experimental class was 3 points higher than that of the control class, the score of the word filling and the completion of the sentence was both 1 point higher than the control class. In the later part of the study, we tested the two classes again. The results of the experimental class were still higher than the control class, and the score was increased from 5 points in the medium stage to 9.5 points. The phrase translation was still the highest with 5 points difference, and words filling and sentence completing were 2 points and 2.5 points higher than before. It can be seen that the lexical cognition neuroscience teaching method has positive effects on the phrase translation, words filling and the completion of the sentences. Among them, the phrase translation was impacted mostly, and the impact of words filling and the completion of the sentences was slightly weaker.

Through the above data, it can be verified that lexical neuroscience has a great impetus to students' English learning, especially vocabulary learning, compared with traditional vocabulary teaching methods.

The lexical processing depth of lexical cognition neuroscience has a certain degree of influence on the use of output lexical chunks. The output of lexical chunks mainly depends on the extraction of vocabulary information.

Both horizontal and vertical contrast analysis told us that the stronger the processing strength of lexical exercises, the better the output lexical chunks memory effect; for students of different levels, the vocabulary practice processing intensity had greater impact on the memory of output lexical chunks of students with good grades, on that of students with normal grades was secondary, and the least was the students with poor grades. In addition, through the performance of students in the English-Chinese translation, words filling, and abbreviated articles, it can be seen that the lexical cognitive neuroscience teaching method also promoted the mastery of grammar knowledge.

IV Conclusion

The lexical cognitive neuroscience is suitable for current secondary vocational students. It can effectively improve the English writing level of secondary vocational students. Through one-semester teaching experiment, we can observe that the scores of essay and the number of lexical chunks used in the essay and writing scale of students in the experimental class have been significantly improved compared with the initial stage of the experiment. The lexical cognitive neuroscience plays a certain role in promoting the English writing teaching of secondary vocational students. The lexical chunk as an ideal model of memory, it conforms to the cognitive characteristics of secondary vocational students; it has very low requirements on computing resources in language application, and its accessibility is very fast, which greatly increases the writing speed. The tasks of language planning, information processing and coding in the process reduce the burden of information processing, improve the efficiency of low-end information processing, and improve the automation of language use, thus ensuring the fluency of expression.

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