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The Influence of Cognitive and Non-Cognitive Factors on the Second Language Learning and Suggestions for Teaching

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Abstract

This paper analyzes the influential factors to the second language learning based on cognitive psychology and psycholinguistics. The analysis is conducted mainly from the perspective of the cognitive factors of the second language learning, such as the understanding of vocabulary, sentence and text and the process of language memorizing, and also from the perspective of non-cognitive factors, such as motivation, emotion, etc. Relevant learning rules are summarized. In addition, this paper also proposes suggestions on improving the effectiveness of second language learning, from the aspects of vocabulary learning, grammar learning, and memorizing strategies in language learning related to cognitive factors, and also from the aspect of motivation related to non-cognitive factors.

Keywords: the second language learning, cognitive factors, non-cognitive factors

1. Introduction

Today, in the context of globalization, there has been an increasingly urgent demand for compound language talents. In China, approximately 400 million people are learning foreign languages, and students in all stages of school education have foreign language courses. Therefore, it is of great necessity to pay attention to the learning and teaching of the second language. At the same time, the second language learning is influenced by both cognitive and non-cognitive factors. By understanding how cognitive and non-cognitive factors affect the second language learning, we can improve the efficiency of teaching and learning from two aspects: teaching and learning.

2. The Influence of Cognitive Factors on English Learning

As the core factor of English learning, cognition affects word recognition, sentence and text understanding, as well as learning and teaching strategies. It can be said that cognitive factors serve as the basis of English learning, and cognitive abilities provide the possibility for language learning.

2.1 Vocabulary Understanding Process

The language cognition starts from hearing and recognize words and phrases. Being able to recognize what you hear is the first step for understanding. People's ability to hear and recognize linguistic information depends on the "mental lexicon" in their minds. As pointed out by Carroll (1999), mental lexicon refers to the mental representation of words and their meanings permanently stored in memory. The information stored in mental lexicon includes conceptual representation and lexical representation. Firstly, conceptual representation refers to the conceptual features of semantics, that is, the connotation and extension of a certain word. For example, we know that "bat" refers to a special mammal that lives in a cave and sleeps upside down. Secondly, lexical representation refers to the information of language at the lexical level, such as morphological and phonetic information. In the face of numerous and complicated language materials, there is a need of a highly structured psychological dictionary with wide coverage in people's mind if they intend to obtain the in-depth meaning. Therefore, establishing a network of words is of great importance in the process of teaching and learning.

2.2 Sentence and Text Understanding Process

Vocabulary is the smallest unit of semantic representation. Apart from the understanding of vocabulary, there is also a need to follow certain grammatical rules to correctly understand the meaning of sentences. Mastering grammar is the key to understanding the relationship between different words in a sentence. On the basis of a good mastering of grammar, people can correctly understand the meaning of a sentence in a very short time (hundreds of milliseconds). In the research on sentence understanding with the help of ERP technology based on high temporal resolution, it is found that there is a relatively flexible relationship between syntax and semantics in sentence processing. More specifically, there are both the processing of syntax dominating semantics and that of semantics guiding syntax. Grammar information originates from a reader's understanding of grammar rules, and semantic information comes from a reader's understanding of vocabulary content and relationships between words. Therefore, an accurate understanding of word meaning and grammar plays a crucial role in sentence understanding (Xu & Liu, 2008).

The understanding of a text is based on the understanding of sentences. The meaning of a sentence in a text not only depends on the meaning of the sentence itself, but also on the order of the sentences. In other words, unrelated sentences are meaningless when put together in a text. Therefore, the understanding of a text needs to process the text information from the perspective that is beyond the sentence itself. Text reading comprehension is the most difficult and complex part of reading psychology. From the theoretical basis, the research on text reading includes the earlier research on schema representation and the later research on situation model. Schema, originated from Piaget's cognitive development theory, refers to an organized and repeatable behavior pattern or psychological structure. It mainly comes from past experience. When people have more experience in one certain thing, they can summarize the general pattern of it. According to the schema theory, the process of understanding text materials is the interaction between the existing reading schemata and materials in the reader's mind. In other words, the reader can obtain the meaning of the text through successfully matching the reading materials with the existing schemata. For example, when reading some argumentative papers, people will have elements related to the structure of argumentative papers in their minds, and they will look for arguments to examine whether there are materials to support or refute arguments. During the process of reading, people will consciously look for information that can support the understanding of argumentative papers. After successfully matching the information, the content of the text can be understood successfully.

Situation model refers to a person's understanding of specific events or states described or experienced in the real or imaginary world, and the psychological representation of the situation described in the current text by the reader. The model emphasizes more bottom-up cognitive processing. The two processing modes of schema and situation are not contradictory. More specifically, schema model is a representation of typical situations, which is a general

representation, while situation model is the psychological representation of a specific situation. Schema model is a relatively stable cognitive structure, while situation model describes a more flexible and plastic cognitive process. In the process of text reading, people not only rely on the understanding of typical situations, but also need to represent the events currently described in the text. Therefore, both of the two models—schema model and situation model are necessary processing methods. Through the two modes of top-down and bottom-up, people can complete the construction of relatively complete information from the text.

2.3 Language Memorizing Process

The ultimate goal of language learning is application, and the basic premise of application is memorizing which helps to store language information in memory. Vocabulary knowledge, grammar knowledge and related cultural background all need to be processed continuously to finally enter the long-term memory system for preservation. In the process of language learning, it is particularly important to pay attention to the role of working memory. Working memory is the memory that is processed at present, and serves as the access to information processing. In the input direction of language learning, only the information that is noticed can be stored in long-term memory through the processing of working memory. On the other hand, in the output direction of language production, only the vocabulary and grammar knowledge that are remembered and can be used by students can be extracted into working memory to support current language processing. The research of Yi et al. (2015) revealed that working memory affects the accuracy of language production. The capacity of working memory is 7 ± 2 modules, with the temporary storage time of approximately 14-30 seconds. This limitation of time and scope can be basically considered to be controlled by neurophysiological basis. Particularly, the storage time is almost unbreakable, but the capacity of each unit can be expanded by some memory measures. The larger the working memory capacity is, the faster the language learning and output processing will be.

3. The Influence of Non-Cognitive Factors on the Second Language Learning

3.1 Research on the Influence of Non-Cognitive Factors on the Second Language Learning

Language learning has its own particularity compared with the learning of other disciplines. The acquisition of a language requires long-term and unremitting training. At the same time, it is highly related to the learners' environment and cultural background. Reading activity itself will affect and even change the non-cognitive factors of readers, and their non-cognitive factors will directly or indirectly affect the reading process, and further affect the role of cognitive factors played in the learning process. Factors, such as learning motivation, emotion, attitude, etc., also affect and restrict the efficiency of the second language learning. Among these factors, learning motivation is an influential factor which is of the most importance and studied the most.

Learning motivation is a lasting driving force of learners to work hard for certain learning goals, which plays a very important role in maintaining learning behavior. Studies have shown that the influential factors to the second language acquisition include motivation (33%), ability (33%), intelligence (20%) and others (14%). Therefore, it can be seen that learning motivation has a great influence on the second language learning. The second language learning normally starts in primary school. At this stage, there is a big difference between learning a second language and learning the mother language. The mother language is mainly learned through implicit and subtle ways, and is usually obtained in a specific situation with parents making real-time corrections. However, the second language is learned more through the appearing ways. Most of the language content and situations learned are separated, and also there is a lack of people such as parents to make real-time corrections. Therefore, the second language learning is more often considered as a course than as a necessary communication tool for survival like the mother language. Its learning motivation is mainly external, related to interest or winning praise and success. Therefore, in the process of the second language learning, students' learning motivation needs to be constantly strengthened and internalized.

The mother language plays multiple roles such as identity recognition and emotion maintenance,

and these emotion factors are weak or even do not exist in the process of the second language learning. If the second language teaching does not pay enough attention to students' feeling and emotion, but merely pursues the teaching outcome blindly and adopts rote learning as the teaching strategy, it may cause students' aversion, thus reducing the teaching efficiency, depriving students of their interests in learning the second language, and reducing their learning motivation.

4. The Effective Use of Cognitive and Non-Cognitive Factors in Improving the Second Language Learning Efficiency

4.1 Lay a Solid Vocabulary Foundation and Strengthen the Connection Between Words

In the mental lexicon of the mother language, vocabularies are connected mutually. If learners want to master the second language at a fluent level, it is necessary to establish a mental lexicon with rich connections. In the second language teaching, although more attention has been paid to vocabulary, and teachers have adopted strategies such as dictation and recitation to make their students master vocabulary more easily, these practices still only make students remember vocabulary more passively, and do not establish a relationship between words. Memory is only the first step in the construction of mental lexicon, but more importantly, it is necessary to construct the connection between words. Therefore, it is better to apply the theme organization method to vocabulary teaching. For example, after learning the word of "football", students can also learn some related words such as "referee", "fan", etc. This kind of teaching method based on theme learning can be considered as a way that is consistent with students' cognitive experience and can help students quickly expand their vocabulary and their vocabulary network. The effect of such teaching will be much better than that of rote learning. An average American can use approximately 3,000 words in the daily life, while the vocabulary requirement of CET-4 is 4,500. Many of the students can pass the College English Test, but they are still not capable enough of communicating with others fluently in English. The key problem does not lie in the shortage of vocabulary, but in the insufficient connection between vocabularies. Therefore, it can be seen that the vocabulary should not be learned separately, but should be learned in a specific context, so as to help students really remember and use vocabulary.

4.2 Strengthen Grammar Training and Teach Reading Strategies

Grammar has always been a difficult problem for Chinese students when they learn foreign languages. Many students who have studied a foreign language for many years can still make many grammatical mistakes. One of the most important reasons is that they only regard grammar as a regular knowledge, and keep reciting these rules one by one, which results in a great burden on memorization. Grammar is not only the organizing rule of a language, but also the internal logic of a language. Therefore, the understanding of grammar must be based on the logical understanding of the language. Since learning the second language is conducted on the premise of having acquired the mother language, the inherent logic of the first language will inevitably affect the learning process of the second language. Teachers should guide students to understand the logic behind grammar, make explanation with typical examples, and focus on the areas where the mother language and the second language are prone to interfere mutually, so as to help students understand the grammar more deeply. For example, "tense" is a very important concept in English, but it does not exist in Chinese. In order to make students understand this grammatical concept, teachers should not only require students to recite different tenses of vocabulary and sentence patterns of the past tense and the past perfect tense, but also lead students from a logical starting point to understand that this is another way to understand time.

The understanding of a text should start from the description of the current text, and also requires students to have a certain understanding of the basic structure of the article, that is, the general schema of article writing. Apart from teaching the foreign language word by word, teachers also need to lead students to grasp the structure of the article from a macro perspective, analyze the writing logic of the article, and have a certain understanding of the general elements that are needed in the article. Through long-term training, students can form a general schema for reading foreign language texts. For example, the basic

structure of "time-place-task-event" can be found in a narrative text. Topic sentences, supporting sentences and conclusion are required in an argumentative text. After understanding the general schema, students can establish construction according to the current situation, and can better understand the content of the article. When doing reading comprehension, it is required to be "intensive" rather than "extensive". Although language learning comes from the accumulation of quantity, only those articles that have been carefully read can be truly digested and understood, and thus accumulation can be achieved. In addition, teachers also need to lead students to find the position of each answer, and be able to make it clear that the answer that they want to choose is based on which sentence or even which word. Such a precise positioning mode will force students to understand the logical structure of the article, rather than simply translating the article. Translation is not equal to understanding. After a certain amount of precision training, students' ability to read texts can be improved.

4.3 Teach Memorizing Strategies to Improve the Effect of Language Memorization

The short-term memory capacity is 7 ± 2 units. For beginners, each letter is a memory unit, which means that memorizing a word is a heavy burden for them. However, if teachers can teach students some effective coding rules, they can help students memorize contents more easily. For example, memorizing Tang poetry is easier than memorizing prose, because the number of words in each sentence of Tang poetry is fixed and the end of the sentence rhymes. This is a way that is easier to memorize contents. Likewise, in foreign language teaching, teachers can also adopt this mechanism to help students memorize contents by using rhymes and poems. At the same time, in the teaching process, teachers need to help students to establish a connection between the old and new knowledge, so that students can remember on the basis of understanding and also carry out more in-depth processing and understanding of learning knowledge. For example, teaching word formation and disassembling the prefix and suffix of vocabulary can help students expand their vocabulary in a short time.

4.4 Mobilize Non-Cognitive Factors and Improve Learning Efficiency

Cultivating students' learning motivation can effectively support the teaching of the second language. Firstly, teachers should help students to understand the meaning and purpose of learning a second language, to understand the importance of learning more languages, to understand the requirements for bilingual and even multilingual talents in the background of the big era from the cognitive level, and to stimulate and cultivate students' internal motivation. Language learning is a long-term process, and cannot rely on the temporary passion. Only when students have an internal motivation for learning can they maintain their learning behavior for a long time.

Secondly, in terms of the emotional aspect, teachers should make students understand toady's multicultural world, make them understand that each language carries a different culture, and integrate humanities, history, customs, geography and other factors related to the language in the teaching process, so as to enhance students' interest and enthusiasm in learning. For example, many young people who are interested in animation learn Japanese intentionally, which means that their love of anime culture has generated their learning motivation. Similarly, teachers can also find out cultural elements that can arouse students' emotional resonance in foreign language teaching. Animation, games, movies, etc. are all elements that can be used for reference and integration.

Thirdly, teachers should effectively apply incentives to help students establish confidence in language learning. The effective second language learning is a long process that requires years of accumulation. Students should have a sense of high efficiency, so that they can keep learning. In this situation, teachers need to encourage and affirm students more, design and organize courses from their actual conditions, create a relatively relaxed and pleasant classroom atmosphere, and encourage students to express the achievements of language learning through drama performance, speech contest, watching movie, dubbing, etc. Through these activities, on the one hand, students can find more fun of language learning, and on the other hand, they can establish a sense of achievement in the learning process. If students can feel that learning a language is useful and meaningful, such sense of meaning can stimulate

their learning motivation from within. People are always willing to do things that can make them feel successful, so are they in language learning. When students obtain positive feedback in their learning, they are more willing to persist and work hard.

Language learning is a long process. Each language contains a different culture and history and carries different thoughts. Language learning should be a complex and systematic process, which requires people to mobilize cognitive, motivational, emotional and other factors to work together. Behind each language is a parallel world. Only after integrating cognitive and non-cognitive factors can people have easier access to the parallel world.

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