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The Enlightenment of Information Processing Theory on College English Teaching

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***Abstract*—The School of information processing theory has made huge contributions in explaining human knowledge learning and skill mastery. After World War II, with the vigorous development of computer science, the working principle of computer has been more and more understood by professionals in the industry. To sum up, it includes the input, storage, coding, processing and transmission of information, and some other links. At the same time, some psychologists have successfully compared and inferred the learning process of human brain for knowledge learning and skill mastery, forming some cognitive processing models of human learning, thus effectively predicting and explaining the mechanism of human learning. Based on drawing on the experience of and interpreting information processing theory and according to the theoretical viewpoints of information processing, the process of College English teaching is rethought. Combining the characteristics of students' cognitive development, designs and optimizes the scientific teaching means and methods should be designed and optimized so as to improve teaching quality.**

Keywords—information processing, college English teaching

I. Information Processing Learning Theory Summary

Information Processing Learning Theory was first put forward by Gagne. Its main content is to explain learning activities from the perspective of information processing. In this theoretical model, the learning process is the process in which the learning subject receives and uses information. The interaction between the learning subject and the environment produces learning behavior, which highlights the characteristics of practical application, so as to better apply the research results of learning theory in teaching practice. Gagne holds the belief that information processing of learning and memory constitutes a typical model of learning. In this model, the external environment stimulates the learning subject, and then transforms it into nerve information through the receptor, and after that, transmits it to the sensory recorder. In the whole process, part of the information is registered in short-term memory by sense, encoding these information from short-term memory. Then store it to long-term memory. When the main body needs to apply information later, it carries searches and retrieves information in long-term memory and then retrieves information. After retrieving information, the main body sends part of the information to the reaction gernerator. Part of the information goes back to short-term memory. Then, verify the retrieved information in short-term memory. If it matches, transfers it to the reaction generator. If not, send it back to long-term memory to retrieve information once again. In addition, there are two parts of the model that have a direct impact on the whole process of information processing, that is, executive control and anticipation. The formor is congnitive strategy, its main role is regulation and control; the latter one is motivation, its main role is learning orientation [1].

It shows that the interaction between students and environment produces learning behavior. Therefore, Gagne divides the learning process into different stages with corresponding teaching events. The external enviornment stimulates students and students internalize the external enviornment. While, teaching belongs tp the category of external events, and teaching design will have an impact on the internal process of learning. Therefore, teaching design model includes drawing attention, defining learning goals, stimulating students' pervious learning memories, using stimulating materials, providing learning guidances, attracting learning behaviors, feedbacking learning effects, evaluating learning effects, improving memory and promoting transfer [2].

In addition to the above viewpoints, Gagne's basic views on information processing learning theory are also reflected in the following two aspects: on one hand, the classification of learning levels. It means that people's learning behavior is complex and diverse, and low-level learning is the basis of advanced learning. Following the principle of simplicity to complexity. Learning behavior can be divided into eight levels: signal learning, stimulus response learning, action, speech association, discrimination, concepts, rules and advanced rule. On the other hand, the analysis of learning. It's results shows that when there are fundamentally changes happened on the students' psychological state, ability and tendency, the results of their learning could be expressed. And the results of learning can be divided into five categories: verbal information, wisdom skills, cognitive strategies, attitudes and action skills.

II. The Promotion of Information Processing Theory to Teaching

A Following the Congnitive Law of Information Processing, Effectively Instructing Teaching

College English teaching is the most important part of the talent training system in China, and it is also a key quality project implemented by the Ministry of Education. College English teaching reform is concerned with how to train a new generation of high-quality innovative talents and top-notch talents, as well as to improve the overall situation of China's comprehensive

national strength and international competitiveness. In order to meet the needs of the society for English under the new national and international situation, the Ministry of Education has issued the *Requirements for College English Teaching (Trial Implementation)*. According to the *Requirements*, the aim of College English teaching is to cultivate students' comprehensive English application ability, especially listening and speaking ability, so that they can effectively communicate oral and written information in English in their future work and social contacts, at the same time, their autonomous learning ability could be enhanced and their comprehensive cultural literacy could be improved, so as to adapt to the development of our society, as well as the need for international communication [3].

B Combining Information Processing Process Model, Designing Scientific Teaching Activities

It is not enough to understand the results of learners' information processing and the way of knowledge representation to really improve the quality of teaching. Information processing gives us more explanations and theoretical models about the learning process, helping educators to better complete their teaching work. Among them, the most representative one should be Gagne's information processing model.

This model consists of three main parts: information memory, mental activity participation and metacognition. The information memory includes three sub-memories, namely, sensory memory, working memory and long-term memory. The goal of information processing is for learners to keep information in long-term memory through these three sub-memories for later use [4].

C Organizing Effective Reinforced Learning Methods According to Forgetting Theory

No matter how dedicate the process of information processing is and how clever the means of processing are, human's forgetting of learning knowledge begins from the process of learning.This is a sad and indisputable fact. How to overcome or weaken the effect of forgetting, so as to ensure the results of memory learning is a topic of concerns to our educators. Psychologist Ebbinghaus found that the process of forgetting is uneven.Forgetting has a fast and slow development trend. Therefore, timely review and enhancement of beneficial learning effect are on the basis of psychological researches.

Forgetting refers to the disappearance or failure in retrieval of memory information. There are some theories to explain the formation mechanism of forgetting. The representative is interference [5]. The so-called interference refers to the loss of information caused by the distraction of other things before or after learning from the current learning [6]. The researcher arranged three equal amount of learning materials (memory materials) and asked the experimenters to memorize them one after another. When all the learning materials were successfully memorized, they were tested. The test results show that the order of material learning has significant effects. For the first group of materials and third groups of materials, memory scored higher, while the second group scored the lowest. The explanation of the interference theory is that the scores of the first group and the third group are higher because these two groups are only affected by the second group, while the second group has the lowest score because it is affected by the other two groups. The results of this study give us the inspiration that decentralized learning is more scientific than centralized learning.

III. THE PRACTICE OF INFORMATION PROCESSING THEORY IN ENGLISH TEACHING

A. Reflections of the Training Objectives of College English Teaching

As teachers who teach college English, in order to implement the Requirements for College English Teaching (Trial Implementation) , we should seek practical and scientific theoretical basis for guidance. On this basis, we should rethink the training objectives of College English teaching, so as to develop students' comprehensive English ability.

How to impart two different kinds of knowledge in the process of teaching? Declarative knowledge can be accomplished by means of oral transmission, text learning, network resources and newspaper browsing. In regular teaching, teachers' lectures and extra curricular English literature reading are effective ways. The acquisition of procedural knowledge is much more complicated. It is not useful to rely solely on words and words. Teachers' correct explanation and demonstration, students' extensive exercises, and teachers' corrections and correct guidance are quite required. Therefore, we can easily find out that in the process of College English teaching, the acquisition of two different types of knowledge has a sequence. Usually, students need to master the necessary declarative knowledge at first, and then transit to mastery of procedural knowledge. For example, the grammatical rule of the present progressive tense is the form of auxiliary verb "be" plus the real meaning verb +ing. This statement belongs to the first type of knowledge, declarative knowledge. However, it is second kinds of knowledge, procedural knowledge, to make students make sentences according to this grammatical rule. Teachers should design reasonable exercises on the basis of students' mastery of grammar rules, guide and correct them at the same time, so as to help students effectively complete the transition of knowledge learning as soon as possible.

How are these two different kinds of knowledge stored in minds? According to the theory of information processing, learners interact with the external environment through the process of information processing, and then individuals can store the processed information and organization in their minds, which is called the representation of knowledge. Generally speaking, declarative knowledge is represented by propositions and propositional networks, while procedural knowledge is represented by production and production systems. Propositions are the smallest units representing declarative knowledge, consisting of topics and relationships. The topic includes subject and object, and relationship describes the relationship between subject and object [7]. For example, "1 love you" is a proposition. In this proposition, I is the main body, you is the object, and the relationship between the two is love. When the subject or object of a proposition is established a connection with other propositions, propositional network appears and complex semantics arises. The representation of procedural knowledge is the

production of poking computer science. The so-called production pattern is generally aimed at psychological processing. Procedural knowledge, that is, skill completion, needs process. Under certain circumstances, when certain conditions are given, a result is bound to appear. When the result is put into the next conditional term, the production system happens [8]. It is a great significance to grasp how learners represent knowledge in order to enhance the effectiveness of English teaching.

B. Summarizing the Teaching Features that can Attract Students' Attention

Scientific summarization can effectively arouse students' attention to teaching characteristics. If the first sentence of each paragraph is interesting content, that can trigger cognitive conflict and seemingly looks different, it will become an effective means to attract students' attention. Perception is the overall understanding and grasp of things, and selectivity is an important attribute of perception. In the learning process, the perceptual perspective held by learners often affects or restricts the learning effect. Teachers should make students lock more psychological resources into important information and improve learning efficiency through correct guidance. Retelling is the most common learning method, which includes two different forms: maintenance repetition and refinement repetition. The former is mechanical memory that we are very familiar with. It is a bad way to learn. The latter is a highly praised method, which emphasizes the establishment of links between new and old knowledge in the process of learning [9]. For example, the teacher asked the students to remember the letters as much as possible. The order of the letters can change "AEEEGGIIIILNNNRRSSTT". Mechanical memory can accomplish this learning task, but the effect is not good. After trying to change the position of letters and combine letters into larger and more meaningful units, refinement repetition occurs, "LEARNING IS INTERESTING". Another effective way of processing is organization. Organization refers to the process of classifying new information to be memorized according to the similarity between projects or the relationship between projects, and forming a certain structural pattern. Choose different learning methods according to different learning context. Information processing gives us a lot of useful enlightenments. Retrieval refers to the process of actively retrieving information from long-term memory, activating information and transforming it into working memory. The activation process generally refers to activating and activating expansion after a clue (presented as a problem) provided by the stimulus scene. The specific steps are as follows: 1. Formation of problem enters working memory. 2. Transform into internal propositional representation. 3.Propositional representation is activated and expanded. 4. Activate the relevant propositions in the original knowledge. 5. If the first 4 steps are implemented, the retrieval succeeds; if they are not implemented, continue the activation and extension [10].

C. The Application of Information Processing Theory in Vocabulary Teaching

In the process of English learning, polysemy is very common. From the perspective of prototype category theory, different meanings of polysemous words can be divided into typical members and marginal members. For example, the core meaning of "school" in Longman Contemporary English-Chinese Dictionary is "a place where children go to be educated". Based on this meaning, we can extend the meanings of "all students and teachers", "curriculum", "college, department, institute", "academy", "school", "group, team" and so on. These meanings are based on the semantic category. The positions of these meanings are equally matched. They are basically the same distance from the core semantics. For example, the original meaning of the word "eye" is "the organ of sight", which refers to human organs. It uses a chain-like semantic derivation method, which derives from the eye to vision, and then to observation and watch. It can also be further extended to judgment, discrimination, observation and so on. In this chain method, the derived semantics are farther and farther away from the central semantics of the word itself.

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