

## Chapter 3

# Theories and Literatures for Technology–Enhanced Language Instruction

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### **ABSTRACT**

*This chapter examines the related literatures and theories for technology-enhanced language instruction. Blended learning, as computer-assisted instruction, has a positive effect on students' learning performances. The research on long-term applications of blended learning in language instruction in middle schools and its effects is hard to find. Nevertheless, some defects exist in the few studies. In China there are much fewer empirical studies on the effects of blended learning on language learning represented by examination scores. Vocabulary learning is essential to English learning and requires the mastery of the pronunciation, spelling, and meaning. Computer-assisted vocabulary learning can provide choice and cloze questions regarding the pronunciation, spelling, and meaning, and give the students instant feedback and grading. The literature review suggests that a quasi-experiment for at least one school term or even longer time in different schools located in various areas is valuable to assure the results' reliability.*

### **INSTRUCTIONAL THEORIES**

In the long history of education, there are many kinds of pedagogical theories and approaches. This chapter simply introduces three of the most influential theories: behaviorism, cognitivism and constructivism. All of them are the theoretical foundation for computer assisted instruction and blended learning. It is noticeable that these fascinating theories are not isolated with each other, and their application in instructional practice is not contradictory. The practitioner should apply appropriate instructional theories to direct instructional practice.

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## **Behaviorism: Learning by Drilling**

The founding researcher of behaviorism is Russian psychologist and Nobel-prize laureate Pavlov. He believed that the association between certain stimulus and behavior causes the learning of the behavior. The essence of behavior change is the formalization of stimulus-behavior association.

The American psychologists E. L. Thorndike, J. B. Watson, Skinner (1954) and Gagné (1962) focused their research on the learning performance improvement through reinforced drill. In Behaviorism the reinforcement is an important concept. The control over consolidation means the control over behavior. The key to learning is the reinforcement of the target behavior.

The pedagogy directed by behaviorism uses prize and punishment, such as the rank and prize in examination and assignment results, to lead the learners to remember or learn some facts or knowledge. For example, the pedagogical approach based on behaviorism is good at helping the students remember the new words and grammar rules in foreign language course.

Another important research achievement of behaviorism is the behavior object analysis from Bloom, Engelhart, Furst, Hill and Krathwohl (1956). It underlines that one lesson should clarify learning objectives, i.e. the concrete behaviors of the learners.

The computer assisted instruction directed by behaviorism lays stress on that the computer should trigger the student's reaction and give the student instant, appropriate and full feedback that may contain the evaluation on the student's performance (Gagné & Wagner, 1988). Tobias (1973) found that the constructive reaction is the most effective approach for the improvement of students' learning performance, and explicit feedback to the students can motivate them and lead to better learning outcome. Clariana and Lee (2001) found that in computer assisted language instruction, explicit feedback can improve the students' learning outcome.

However, the research of cognitive load theory shows that too much feedback to the students may become a cognitive load, make the students anxious and fretful, and even disturb the students' concentration and attention (Paas & Van Merriënboer, 1994; Paas, Tuovinen, Tabbers, & Van Gerven, 2003; van Merriënboer & Sweller, 2005). For language learning, providing the students with lower verbal and visual capability with just the most fundamental learning material will be more effective (Chen, Hsieh & Kinshuk, 2008).

## **Cognitivism: Learning by Understanding**

Cognitivism argues that learning is a multilayer process that handles, explains and assesses information. Therefore it is crucial to study and understand the complex procedures in human brain: perception, decision making, problem solving, relationship understanding, and so on (Anderson, 1983; Newell & Simon, 1962; Stillings, Weisler, Chase, Feinstein, Garfield & Rissland, 1995). The new behavior is acquired through the deep understanding of the environment.

According to cognitivism, instruction is not mere the knowledge transformation from one person to another one, but the active acquirement of the student. The cognitivists argue that the student should be active in handling information, for instance, organizing known information, reacting like attention and selection, searching related information to solve problems. The teacher should prepare the students with good conditions to motivate the students, and with proper learning strategy to assist their learning (Kemp, 1971; Gagné & Briggs, 1974; Dick & Carey, 1978).

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