Optimal Designing of Blending Teaching Strategy Base on the Knowledge Category System

Ning ZHAO\textsuperscript{a} and Qin FU\textsuperscript{b}

School of Information Engineering, Wuhan University of Technology, Wuhan, P.R. China, 430070
\textsuperscript{a}zhaoning@whut.edu.cn, \textsuperscript{b}fuqin@whut.edu.cn

Keywords: Blending teaching; Knowledge category; Teaching strategy.

Abstract. In this paper, based on the Blending teaching theory, we propose a new teaching structure that different teaching strategies would be adopted according to the knowledge category system. The main purpose of this model is to arouse students' interest in learning their major courses under the blending teaching environment. Simultaneously, the effect of classroom teaching would be improved.

Concept and Characteristics of Blended Learning

With the rapid development of information technology, EoT (Education on internet) is progressing step by step towards a deeper and broader level. Diverse emerging network educational resources such as video courses, MOOC (Massive Open Online Courses) not only break through the traditional teaching mode, at the same time, but also construct a kind of Blended Learning Environment with a new communication mechanism and rich resources [1, 2, 3]. More multimedia course materials and related extension of resources could be provided to students by network-based teaching platform in this environment, which actually compensate the flaw to a large extent of only by singleton teaching pattern. Normally, classroom teaching and network learning are two logical starting points of blended learning [4]. Therefore, effective teaching strategies apply to the blended learning mode according to different teaching objectives and contents have become a hotspot in this research area.

Building a Targeted Knowledge Category System

According to some researches, academic knowledge generally could be divided into three types such as declarative knowledge, procedural knowledge and tactical knowledge [4, 5, 6, 7]. Students commonly extract the declarative knowledge mainly from kind of knowledge clues. Moreover it also could be directly retold by learners. Due to relatively easy to understand, this kind of declarative knowledge should be explained to students by teacher within the classroom time. As a type of static knowledge, there is hardly change during the learning process. Therefore, rote becomes the best method to grasp the declarative knowledge.

The procedural knowledge is a type of procedure knowledge which has the characteristics of practicality and operability. A number of scholars (plus study result classification, the bloom education cognitive domain, Ausubel, Anderson) believe that the procedural knowledge should be mainly reflected from several aspects as discrimination, basis concept cognitive and solving common problems.

The core idea of the tactical knowledge is to show students how to think, create and innovate [8-9]. The main purpose of it is to cultivate cognition ability, knowledge procession ability and organization ability base on adjusting students' attention, memory, and illogical thought. It also trains the student to flexibility in apply of the declarative knowledge and procedural knowledge. Thus, to some extent, the tactical knowledge is more important than the previous two kinds of knowledge during the process of teaching and learning.

Teaching Scheme Selection Base on Targeted Knowledge Category System

Generally, diverse types of knowledge have different teaching features [10]. In this section, we will further select appropriate teaching strategies and schemes according to these features. Also, in order
to present the advantage of online teaching platform, we will give priority to in the process of teaching mode selection using blended learning to complete the teaching of different kinds of knowledge.

Firstly, knowledge cognition preserving and concept extraction are the key factors declarative knowledge. Therefore, during the teaching process of declarative knowledge, it is important to emphasize on applying appropriate methods to enhance details-memorizing of students, so that the students could keep cognizing declarative knowledge for a long time. Furthermore, for the teaching scheme, offline face-to-face-classroom-teaching would be a better strategy. It would help students to activate the original knowledge and concentrate in the process of learning and memory thought language and eye contact with teacher. Definitely, images, audio or animation, video and other multimedia tools are also welcome to include into teaching process in order to promote students to make related concept extraction and multiple knowledge coding.

Secondly, the structure system is the kernel of the procedural knowledge. Namely students would have capability of establishing a correlative relationship between new knowledge and course content which they have already learned. And, a concept system of entire gained knowledge could be built. Therefore, before teaching this type of knowledge in the class, teacher would have an overview picture of foreword and following curriculums for building a bridge between “the old knowledge” and “the new knowledge.” This bridge is also a perfect and effective cognitive network which to make the students constantly bring new concepts, definitions and knowledge into this piece of cognitive network. From the above analysis we can clearly see that in the process of teaching procedural knowledge, teacher should resolve the cognition chaos predicament of students while they build the knowledge system through keep analyzing and the thinking features of students and excite there learning interest. In addition, the teaching programs or plans should be adjusted timely mainly according to performance and feedback of students in class. It is clearly that offline face-to-face classroom teaching atmosphere, therefore, has more advantageous to the students for effective learning of conceptual knowledge.

Thirdly, the tactical knowledge commonly refers to a series of rules, principles, methods and formulas which are used to solve the theoretical or practical application problems in the practice. It is found that case specification method would more appropriate to teach this type of knowledge. Teacher could present some common engineering problems while students are required to determine the conclusion data or solutions by applying the specific formulas or theorem. The main responsibility of teacher is to actively stimulate students’ curiosity and exploring spirit to find laws and principles by providing students with a typical project example. Apparently, it is more convenient to publish the engineering examples through online teaching platform. And students can upload the deduction conclusion at any time to the online platform for correcting. Therefore, for the tactical knowledge, online teaching sachem would be the best choice.

Conclusion

In order to give full scope to positive function of online teaching platform, in this paper, we explore several optional teaching schemes based on the knowledge category system under the blending teaching environment. Moreover, we also put forward the corresponding teaching strategy and teaching methods for each type of knowledge.

Acknowledgement

This research was financially supported by the Teaching Research Foundation of Hubei Province. (No. 2018143).
References


