

Deep Learning in English Classrooms under the Framework of Teacher Digital Literacy: Connotation, Process and Strategy

Huiping Hu*, Wenli Gao

Department of Primary Education, Shangrao Preschool Education College, Shangrao, China

*Corresponding author: 448793432@qq.com

Abstract

Classroom deep learning is a process in which students realize the perfection of cognitive structure, the development of key abilities and complex emotional experience under the guidance of teachers, through the understanding and creation of knowledge. Classroom deep learning specifically includes four aspects: activation, connection, evaluation and migration. In order to promote students' deep learning in class, teachers need to establish learning objectives, refine learning content, design learning activities, and promote students' interactive participation based on three-dimensional analysis of students: multi-dimensional interpretation of subject knowledge, respect for learning rules, and attention to learning environment.

Keywords

Classroom deep learning; process; strategy.

1. Introduction

Learning in class is the main way to cultivate core literacy and achieve all-round development for students. However, the instrumental, utilitarian, procedural and unidirectional learning view makes the classroom learning become shallow and narrow [1], which leads to the superficial and expressive learning of students in class and then affects the cultivation of students' core qualities and the improvement of key abilities. At the same time, "deep learning", as a hot topic in the research field, provides a direction for solving students' problems in classroom learning and guiding the real and effective occurrence of learning changes. Then, what is the deep learning? how to make deep learning happen? how to achieve deep learning? this is the key problem discussed in this paper.

2. What is the "Deep Learning"?

2.1. Deep learning is in the complex thinking process.

Deep learning (Deep Learning) in the field of education was originally a concept compared to shallow learning (Surface Learning). In 1976, the American scholar Marton first put forward the concept of deep learning. Deep learning is on the basis of understanding, in which learners can critically learn new ideas and facts, dig into the original cognitive structure to connect among many ideas, exist knowledge migration to the new situation, and make decisions and solve problem.[2] With the development of society and the advancement of research, domestic and foreign researchers have a richer and different understanding of the connotation of deep learning. So, for students, what is the deep learning of classroom? And what is its connotation? The concept of deep learning is proposed for shallow learning. In contrast, shallow learning is a simple, and mechanical way of learning, which is not related to students' individual life experience and cultural background. It mainly focuses on factual memory, and learners look at the accepted information in an irrelevant way. The process of deep learning is more complex.

For example, some researchers believe that deep learning, as an active, inquiry and understanding learning method, requires learners to conduct understanding learning, deep information processing, critical high-order thinking, active knowledge construction and knowledge transformation, effective knowledge transfer and solution of real problems[3]. Some researchers propose that the key to deep learning is the self-transformation of information, and students need to process, understand, evaluate, apply, and reflect on their own learning.[4] It can be seen that, compared with the general shallow learning, the thinking process of students' deep learning in class is more complex. It not only includes students' mastery and understanding of knowledge, that is, processing information and understanding information mentioned by researchers; but also involves students' application and creation of knowledge, that is, knowledge transformation, application and migration of knowledge, problem solving, reflection and other advanced thinking activities. It should be noted that deep learning does not exclude shallow learning and is a separate continuum with shallow learning[5]. Shallow learning provides a certain foundation for deep learning. In this sense, deep learning is the continuation and deepening of shallow learning.

2.2. Deep learning is in the rich learning results.

From the perspective of learning results, deep learning pays more attention to the improvement of students' cognitive structure, the development of key abilities, and the experience of complex emotions. William and Flora Hewlett foundation (William and Flora Hewlett Foundation) believes that deep learning is the students qualified for the 21st century work and citizen life must have the ability. These abilities can let students to grasp and understand subject knowledge and apply the knowledge to solve the problems in the classroom and the future work, mainly including mastering the core discipline knowledge, critical thinking and complex problem solving, teamwork, effective communication. According to the US National Research Council (National Research Council Panel), deep learning is the process in which individuals apply their learned knowledge from one situation to another, that is, the transfer.[6] For classroom deep learning, firstly, the cognitive structure of students can be reconstructed and improved; secondly, their key abilities, especially advanced cognitive abilities, can be improved and developed; Thirdly, students experience more profound and complex thoughts and emotions through learning. This learning result is brought about by the complex thinking process that students experience in classroom deep learning.

2.3. Deep learning is in the full teaching guidance.

Students are the main body of the classroom, but the realization of students deep learning cannot be separated from teachers' sufficient and in-depth teaching guidance. The research conducted by the "deep learning" project team led by Professor Egan (2010) shows that the research of deep learning has shifted from a single learning technology to a focus on the teaching process, focusing on the correlation and consistency of deep learning and deep teaching[7]. Students' deep learning in the classroom is bound to be unified with teachers' sufficient teaching guidance. Without the full and deep guidance of teachers, students' learning can only be a kind of self-study. Teachers' full guidance to students' classroom deep learning is reflected in two aspects: first, the occurrence and development of classroom deep learning are caused by teachers' teaching, which is realized under the careful design and planning of teachers. As some researchers pointed out, deep learning needs to connect real-world, meaningful and problem-solving learning tasks, and teachers need to design such learning environments to support the occurrence of deep learning and gradually pay attention to the process and results of deep learning.[8] Second, classroom deep learning is the collision of students through the interaction with others, and finally complete the complex thinking process. Fredericks (Fredricks) believes that only from the three dimensions of students' behavior, emotion and cognition can we truly achieve the deep learning needed for school success

today.[9] This means that teachers' guidance can only make students participate in emotional, cognitive and behavioral participation in classroom teaching. To sum up, classroom deep learning is a process in which students realize the perfection of cognitive structure, key ability development and complex emotional experience through the understanding and creation of knowledge under the guidance of teachers.

3. How Does Deep Learning Happen?

Deep classroom learning involves students' understanding and creation of knowledge, but how does the specific process happen? From the perspective of information processing, Gagne believes that learning is divided into eight stages: motivation, comprehension, acquisition, retention, recall, generalization, homework and feedback.[10] Mayer proposed that learning begins with the attention of the learner's attention-activates the original knowledge-find out the internal connection of new knowledge-establish the connection between old and new knowledge-newly acquired knowledge into long-term memory.[11] Chinese scholar Pi Liansheng believes that broad knowledge learning is divided into three stages: meaning acquisition stage, knowledge consolidation and transformation stage, and extraction and application stage.[12] In class, although different students may experience different learning processes when facing different disciplines and different teaching situations, combined with the existing research and analysis of the learning process, classroom deep learning may include four links in terms of broad and general knowledge learning.

3.1. Activation: the stimulation of learning motivation and the preheating of knowledge and experience

Deep classroom learning begins when students' learning motivation and relevant knowledge and experience are "activated". On the one hand, learning motivation is formed through teachers' teaching and students' own experience, which has a promoting effect on the whole learning process of students in class. With the motivation, the students' classroom learning behavior will continue to point to a certain learning purpose. On the other hand, teachers attract students' attention in certain ways, and students consciously encode the information related to the current learning task, and store it in short-term memory. At the same time, they activate the relevant knowledge and experience in long-term memory, so as to prepare for the next stage of "connection". In class, the key to "activation" lies in the teacher finding the starting point of students' endogenous learning ability and attracting students' attention. Therefore, the classroom teaching in this stage should pay special attention to two points: one is pertinence. Only by capturing students' learning needs and interest points can the classroom teaching stimulate students' motivation for continuous learning. On the basis of grasping students' interests, teachers can put forward the practical problems that need to be solved urgently at present, or the propositions that contradict with students' original cognition, so as to stimulate students to think and explore continuously. The second is directivity, that is, classroom teaching must point to the purpose of learning, which is closely related to the learning theme. Activate students' learning motivation is not just to interest students, but to promote continuous learning; teaching is not to "activate" students' existing knowledge experience, but to help students "activate" existing knowledge experience related to new knowledge to prepare for the next step of learning. On the contrary, if the teaching is not clear about the learning purpose and theme direction, even if it can arouse students' interest, it will not really achieve "activation". Activation is a link that all students must have in their learning activities. By stimulating learning motivation, attracting students' attention, and triggering the "point" of students' interest, emotion and thinking, students can do a good job of "preheating" from the two aspects of learning motivation and existing knowledge and experience. Although

"activation" is only a temporary internal state, it will play a role in controlling the execution, driving and promoting students to pay continuous attention and enter the next link of learning.

3.2. Connection: to establish the internal connection between the existing knowledge and experience and the new knowledge

Connection is the internal correlation between existing knowledge experience and new knowledge in the process of deeply processing the new knowledge they pay attention to. As the first rationale of learning in the Community of Learning Scientists suggests: " Any learning by students is based on their pre-concepts of how the world works. In teaching, they may be unable to grasp new concepts and information. Maybe they can remember this new knowledge for the test, but after the test, they are back to the original concept." [13] Students' existing knowledge and experience greatly affect their interpretation and understanding of new knowledge, and affect their ability to remember, reason, solve problems and acquire new knowledge. One of the manifestations of this influence in the deep classroom learning is "connection", in which students establish associations between existing knowledge experience and new knowledge. Students' existing knowledge and experience include not only the students' original subject knowledge, but also the non-book knowledge, including various experience of classroom learning and daily life experience. Therefore, the essence of connection is to strengthen two kinds of correlation: first, the association between new knowledge and old knowledge. Specifically, it includes two ways. One is the logical correlation, that is, the logical integration between the old and new knowledge, including the whole and part relationship between the new knowledge, the sequential relationship between the front and back knowledge, and the parallel relationship between the left and right knowledge. Any knowledge does not exist in isolation, "knowledge depends on the specific social background and natural background" [14]. Classroom deep learning requires students to grasp the "context" of new knowledge, and the background of new knowledge is often lost in the students' existing knowledge, students need to timely extract and establish a connection with the new knowledge. Second, the correlation between new knowledge and students' existing experience. The American educator Ebel once pointed out, " a person's experience (direct or indirect) and all the contents of memory, can become a part of his knowledge." [15] Strengthen the connection between personal knowledge and experience, not only helps students to better understand the new knowledge, but also helps students to transform the experience into knowledge after thinking processing.

3.3. Evaluation: the judgment and analysis of the self-cognitive structure and cognitive process

Evaluation is a process in which students judge and analyze their own cognitive structure and cognitive process after establishing the connection between the old and the new knowledge. The evaluation of deep learning in class is different from the general evaluation in that the former emphasizes more on self-reflection and evaluation. Specifically, the classroom deep learning mainly includes two aspects: first, to evaluate the self-cognitive structure to form a new cognitive structure. In the connection link, students establish the internal relationship between existing knowledge and new knowledge; in the evaluation link, the relationship between old and new knowledge-determines the two ways: when the new cognitive knowledge is consistent, students will enrich and expand the existing knowledge on the basis of the existing cognitive structure. Second, the evaluation of the self-cognition process, form the corresponding discipline thinking method, and experience positive emotions. Students reflect on and evaluate the selection of learning resources, the choice of learning resources, the application of learning methods, the arrangement of learning time, and the degree of effort.

3.4. Migration: the accurate extraction and comprehensive application of knowledge

Forming a new knowledge structure is not the end of learning. Through the deep classroom learning, students should not only improve the cognitive structure, but also realize the key ability development. According to the learning theory, students' deep learning migration is divided into two kinds: one is the vertical migration, namely the learning new knowledge as the basis of learning more complex knowledge, also is the evaluation link formed by the cognitive structure as a foundation or component to the more complex and large cognitive structure. The second is horizontal transfer, that is, to apply the new learned knowledge to similar new situations, through the situation to make students internalized knowledge explicit and operational, and promote the improvement of students' comprehensive practical ability. Transfer is the last link of classroom deep learning. It is not only to improve students' cognitive structure, but also to promote students to improve their comprehensive practical ability in the horizontal transfer, and to lay a foundation for subsequent more complex knowledge learning in the vertical transfer.

4. Summary

How does the class achieve deep learning? It requires teachers' strategies of promoting students' deep learning in class. The realization of students' deep learning is closely related to teachers' careful design and implementation of teaching. In order to promote students' deep learning in class, teachers must establish learning objectives, refine learning contents, design learning activities, and promote students' interactive participation based on three-dimensional analysis of students, multi-dimensional interpretation of subject knowledge, respect for learning rules, and attention to learning environment.

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