On the Construction of Autonomous Learning Environment in Colleges and Universities under the Condition of Network Information Technology

ErYan Ni*

Guangdong Industry Technical College of Higher vocational institute, China

*Corresponding author e-mail: Nifryan@163.com

Abstract. In recent years, colleges and universities pay more and more attention to the autonomous learning of college students. Autonomous learning is not only conducive to the improvement of students' academic performance, but also the premise of individual lifelong learning and lifelong development. Information technology has made great changes in people's life and learning style. Autonomous learning based on information technology has become an important learning style. Information technology can provide a strong support environment for autonomous learning, but it will not naturally become a good support for autonomous learning. We must design it carefully to make it play the maximum effect. From the perspective of subject teachers, the author will study the construction of autonomous learning environment based on information technology from two aspects of theory and practice, and provide good support for students' autonomous learning to improve students' learning performance and cultivate students' information literacy.

Keywords: Information Technology, University, Autonomous Learning, Autonomous Learning Environment,

1. Introduction
Since the introduction of constructivism teaching theory, every field of education in our country has been affected in different degrees, mainly reflected in the shift from attaching importance to teachers' teaching to students' learning[1]. At the same time, the design of the learning environment has become a hot research field in current educational psychology[2]. Since the 1990s, many experts and scholars at home and abroad have transferred more energy from traditional practice to the design of a good learning environment and conducted a lot of research.

As can be seen from the figure, this model consists of six parts. Among them:
(1) the problem one is the center of learning environment design, which is all kinds of problems that learners should try to solve or resolve to solve.

(2) related example 1 is to provide learners with relevant experience for reference to support learners' learning.

(3) information resource I - provide detailed background of relevant problems, preparatory knowledge required for understanding problems and various information resources related to problem solving.

(4) cognitive tools are mental models and devices that support and expand users' thinking process, usually visual information processing software, which functions as a scaffold of personal cognitive ability.

(5) conversation and collaboration tools support learners to work together to solve problems and construct the meaning of knowledge.

(6) Social background support learning environment support.

In addition to the above six elements, the model also provides three independent teaching strategies and some specific learning environment design principles[3]. Autonomous teaching strategies include modeling strategies, coaching strategies and scaffolding strategies. Modeling strategies include behavior modeling and cognitive modeling[4]. Design principles such as "assessment should be a tool for self analysis", "teaching objectives should be negotiation rather than imposition", etc. Generally speaking, Jonathan believes that: students should be provided with a variety of different representations of world knowledge to show the inherent complexity of the world itself; learning should focus on meaning construction rather than knowledge products; and the case-based learning environment in the real world should be provided to facilitate learners to construct situation related knowledge through communication and cooperation.

2. Elements of autonomous learning environment in colleges and universities Based on information technology

Based on information technology, the elements of College Students' autonomous learning environment refer to various resources and supporting conditions that college students must have in the process of autonomous learning[5]. The first step of autonomous learning is to determine learning objectives and make learning plans. Therefore, the autonomous learning environment of colleges and universities needs to provide the situation of tasks / problems. According to the situation and their own characteristics, college students determine their own learning objectives and make learning plans. As Figure 1.
Choose learning content
Determine learning objectives
Task / Problem

Evaluation / Modification

Autonomous Learning Environment

Download learning resources
Acquisition of learning tools
Learning strategy planning
Interactive learning environment
Learning achievement test
IDC Technical support

Figure 1. Schematic Diagram of Autonomous Learning System

In addition to the supporting factors mentioned above, the teaching strategy used by teachers in the process of guiding autonomous learning is also a very important factor, which directly affects the learning behavior and effect of college students in autonomous learning.

In summary, the author believes that the information technology-based autonomous learning environment in Colleges and universities should include six basic elements: task / problem situation, learning tools, learning resources, learning and teaching strategies, multi-directional interaction and self-evaluation of college students, and six elements support college students' autonomous learning[6]. Interaction is the soul of autonomous learning environment based on information technology. Without interaction, the power of each element of autonomous learning environment is difficult to play. From the perspective of college students, interaction has four directions.

Between and the teacher / help system. When college students encounter difficulties and need help in the learning process, teachers or systems timely give appropriate guidance, suggestions, hints and feedback to help college students make the best use of their cognitive resources and knowledge and make appropriate decisions.

3. System support for autonomous learning

The innovation is mainly reflected in the design of a model of independent learning environment, combined with the construction practice of "Computer Culture Foundation" course using information technology, the establishment of a platform for independent learning of the course, the enrichment of the resources of the network computer room, the establishment of a group for independent learning of the course, the combination of multimedia classroom, network computer room, independent learning
platform and learning communication group, We should change the teaching mode and build an independent learning environment based on information technology.

3.1. Choose the content of autonomous learning
For college students, there are many contents suitable for autonomous learning, whether it is factual knowledge, or some controversial knowledge, which need deep processing, can be regarded as the object of autonomous learning. For the study of advanced knowledge, such as the latest frontier issues, hot issues, etc., it is especially suitable for autonomous learning, so that students can actively construct on the basis of reading a large number of documents. Generally speaking, the content of self-learning should be relatively complete, and it is generally carried out in units or large themes.

3.2. Determine the overall goal of autonomous learning
The teacher analyzes the overall goal of unit teaching to determine the level or ability that students should achieve through autonomous learning, including the goal related to the development of autonomous learning ability. Then: according to the overall goal and combined with their own situation, students make step-by-step learning goals. In this way, students can be trained to make learning plans.

3.3. The design of elements of autonomous learning environment in colleges and universities based on information technology
According to the self-regulated learning objectives and contents, the learning environment is designed from six elements with the support of information technology. "Task / question situation" is placed at the beginning of the learning environment, which means that it is suitable for the development of task / question centered learning activities in the autonomous learning environment. In the creation of autonomous learning environment, we should fully reflect the idea of "learning" as the center. Therefore, several other elements of learning environment are arranged in parallel and non-linear progressive.

3.4. Creating a course independent learning support system based on information technology
At present, every university has access to the Internet, has its own campus network and a certain number of multimedia classrooms, network rooms, which provide the material basis for the creation of the independent learning environment based on information technology. In the teaching process, according to the characteristics of the subject and the requirements of the autonomous learning environment, the author uses the functions of the Network-based Autonomous Learning Platform, the multimedia classroom, network computer room and QQ group to build the information technology-based autonomous learning support system.

4. Summary
In the 21st century, with the rapid development of information technology, the amount of knowledge and information is growing and updating at a geometric speed. In order to survive and develop in the information society, college students must learn to study independently. Autonomous learning is not only an important way for college students to improve their academic performance, but also a prerequisite for their individual lifelong learning and lifelong development.
Any learning takes place in a specific learning environment. Information technology plays an all-round supporting role in the construction of an autonomous learning environment, which can provide a variety of autonomous learning tools to enable students to "learn"; it can provide rich learning resources to enable students to "want to learn"; it can provide a convenient interactive platform to enable students to "learn"; it can provide an efficient evaluation system to enable students to "stick to learning". Therefore, the use of information technology in the design of the autonomous learning environment in Colleges and universities can provide good system support for the autonomous learning of college students, which is conducive to improving their academic performance and information literacy.

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