Constructing of research-oriented learning mode

based on network environment

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Abstract: Research-oriented learning mode that based on network is significant to cultivate comprehensive-developing innovative person with network teaching in education for all-around development. This paper establishes a research-oriented learning mode by aiming at the problems existing in research-oriented learning based on network environment, and combining the characteristics of network learning in China. This paper also analyses learning-objective orientation and the choice of learning evaluation. Based on the foregoing, the paper brings forward the consideration of the further task.

Key words: network; research-oriented learning; learning mode

People's innovative spirit and comprehensive development are required in 21 century. Research-oriented learning, responding to the requirement, which aims at cultivating students' innovative spirit and promoting their comprehensive development, has been turning into an important part of the Reform of Curricular Structure of General Senior High School in China. The information era requires that an innovative person should have the abilities of obtaining, analyzing, processing and disposing information. So, network comes into our visual field naturally. Teaching with network provides important conditions for actualizing Research-oriented learning, and makes impact that we have never had before on the whole curricular and education system. Therefore, the establishment of research-oriented learning mode that based on network is significant to cultivate comprehensive-developing innovative person with network teaching in education for all-around development.

1. Meaning of research-oriented learning

Research-oriented learning means courses of research-oriented learning and the mode of research-oriented learning. It means a learning activity that students choose and confirm subject from the nature, society and life to study and obtain, apply knowledge during the research process to solve problems under the teachers' guidance (Brenda & Janet, 2006, p. 255). As a learning mode, research-oriented learning is brought forward aiming at receptive learning. Comparing to students' passive acceptance of the already known knowledge in the traditional receptive learning, the research-oriented learning mode emphasizes on that the teachers do not tell conclusions to the students, but use questions as carrier to make learners construct knowledge, which stresses on students'

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feelings and experience during the process.

Based on the foregoing concepts, we conclude that the core of research-oriented learning mode is creating a kind of learning environment that use exploring problem as the core, which could make students construct knowledge actively so that they can develop their abilities of research and creating, and gain comprehensive development.

2. The existing problems in research-oriented learning based on network environment

2.1 The warp of course idea

Research-oriented learning aims at cultivating people's innovative spirit and comprehensive development. It emphasizes that new objectives and subjects have being made along with the spread of the process and the need of learning environment. However, the phenomena of exceed one's duties and meddle in others' affairs is still existing in the practice of research-oriented learning. At the beginning of enforcement, teachers always pre-establish the instructional objectives and research subjects in order to monitor the research process; furthermore, they do not allow students departing the pre-established research direction. All of these run counter to the objective-making orientation of research-oriented learning. In the final analysis, it is the reason that the whole course idea is still resting on the traditional subject expert Tailor's objective mode with basic flow of bringing forward questions, analyzing questions and solving questions. Therefore, it can not change the existing phenomena that are carrying out examination-oriented education and teaching subject courses in the morning, but turning into education for all-around development and actualizing research-oriented learning in the afternoon. Certainly, it does no good to actualize meaningful research-oriented learning effectively.

2.2 Lack of evaluation instrument

It is well-known that the construction of information in research-oriented learning is necessary, which are not only the evidence of students' participation in course research, but also the important basis to evaluate the outcome of students' research and the process of research-oriented learning. However, the schools always emphasize excessively on the information constructing during the process of research-oriented learning in their practice which makes students filling in a mass of forms during every approach from choosing research subjects and actualizing process to finish the subjects. It increases students' insignificant shoulder in a great extent and ignores the independence of process and the building of objective, which makes research-oriented learning becoming a representation of formalization. (YANG Ming-sheng, 2004)The reason is lacking of evaluation instrument that can record the development of process-learning conveniently to realize the automatic monitoring evaluation of learning process.

3. The construction of research-oriented learning based on network environment

Learning mode stands for the basic particularity of educational teaching activity, which provides scientific operating pattern for educational practice, and also incarnates profound thinking method. Learning mode generally involves the purpose of teaching, the process of operating, the condition of realizing, roles of teacher and student, and the evaluation, and so on. Aiming at research-oriented learning, combing the characteristic of network and theoretic research, we think that we can establish initially research-oriented learning mode basing on network application with these aspects of the learning objective orientation: The choice and design of learning content, the establishment and management of learning group, the design of the research-oriented learning process,

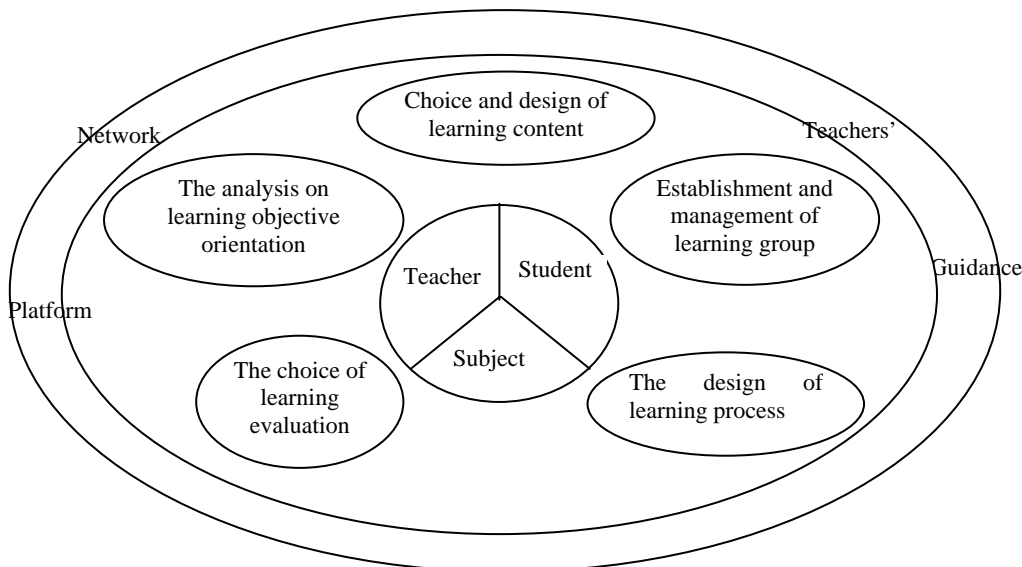the choice of learning evaluation, the establishment of network platform and the teachers' development.

Chart 1   The frame-chart of research-oriented learning mode based on network environment

Research-oriented learning is a new learning mode which uses "subject" as carrier, representing students as main body, and leading by teachers. So, we put "teacher", "student" and "subject" in the center. Around the three are the five approach that must be confirmed in the constructing of research-oriented learning mode, which are the analyze of learning objective orientation, the establishment and management of research group, the design of learning process, the choice of learning evaluation. The outermost circle represents that the development of research-oriented learning is based on network platform and guided by teachers. Altogether, the whole research-oriented learning mode is an opening system that establishes subject as its center. It takes learners as center, guided by teachers and based on network platform to connect a learning community which is integrated with virtual reality. So, we can realize research without jumping-off and end-point, and also space-time limitation.

Aiming at the foregoing problems existing in research-oriented learning based on net- work environment, we will discuss about the instructional objectives orientation, the choice and design of learning content and the choice of learning evaluation.

3.1 Analysis on the instructional objectives orientation

3.1.1 Three classical instructional objective orientations

(1) Behavioral objective orientation roots in a part of antique master and apprentice system, which requires students finishing certain, idiographic tasks in prescribed time. It has the merits of concretion and strong maneuverability, but the disadvantage of which are emphasis on outside behavior result and ignorance of inside psychological process.

(2) Evolving objective orientation, which aims at the deficient of behavioral objectives, emphasizes the objectives that come into being in certain situation and the interactive process between teacher and student. Though it is beneficial to cultivate the ability of using knowledge to solve practical problems, it is difficult to operate.

(3) Expressive objective orientation is the fundamentally counter activity to "behavioral objectives" which makes further compare of behavioral objectives. It takes courses as the process to exert students' effect as main

body and emphasizes their individuality development and creative behavior. The merit of it is respect of initiation, diversity and open, and the disadvantage is that the objective is too blurry to assure the student master the necessary content.

3.1.2 Network's support to realize the learning objectives

The plentiful resource, boundless time and space, opening interactive communication and convenient free expression of network help the objective realization on:

(1) Increasing students' choice of learning subjects, research accompanier and research content which is good to realize the evolving purposes;

(2) The individual shows his/her peculiar and creative activity in time to promote the realization of expressive objectives.

3.1.3 Analysis on instructional objectives orientation of research-oriented learning based on network environment

The most prominent characteristics are initiative explored process, one's own experience and the solution of situated problems. The main objective of research-oriented learning is not understand what have been explored, but make students explore knowledge actively. Using the foregoing three basic objective orientations, combining with the characteristics of research-oriented learning and the predominance of network, we integrate behavioral objective, evolving objective and expressive objective as the objectives orientation of research-oriented learning. It can ensure that students could master the basic content of the courses they must learn. Meanwhile, it can cultivate persons who have moral and team spirit, full-developing natural talent and ability of producing and solving problems with creativity in uncertain situation.

3.2 Choice of learning evaluation

The objective of choice of learning evaluation for research-oriented learning is not *distinguishing* but accelerating *changing development*. The basic activity mode of the evaluation is not *making sure* but *making dialogue*. And the implementary process is not *monitored by system* but *corresponded by self-organization relationship*. The evaluation is mainly realized by the learners' self-reflection. The result of it is not simple mark or grade. It needs to establish an opening community with criticizing and sustaining (WANG Tian-rong, 2001). In order to evaluate the learning process, we design and develop the evaluation monitoring system, which could automatically follow, diagnose and evaluate the learner's learning circumstance and make value judgments for students' attitude, knowledge and the developing level of their abilities in the learning process. Through recording and feeding back students' learning time, learning content, learning interaction and learning effect, we realize the monitor to the learning process (CHEN Yun-hong, 2003, p. 69). Through the system of evaluation—feedback—rectification, we lead the students' learning attitude advisably to make them adjust learning method so that they can use learning resource and modern information technology effectively to learn independently and achieve anticipative learning objectives. The constructing of evaluation-monitoring system includes the following modules:

(1) Leaning time monitor: Make records of the learner's time used in network courses. The time of every web page is recorded 10 seconds after the learner's browsing. Take the network course *Medical Education Technology* as example, which has ten chapters, two chapters can be learned in one week, so the learners' time on internet should be more than 4 hours, then he could learn this course earnestly.

(2) Learning content monitor: The monitor of the learner's learning situation (the learning knowledge points, which have been learned and have not been learned); the state of homework submission (examining what

homework the teachers have given to students, the finishing time, the submitting time limit and which have been submitted and which have not).

(3) Learning interactive monitor: The monitor of how many times the learner logs on the forum and his state of delivering articles.

(4) Learning result monitor: Using the form of online test, including formative exercise, passing examination, checking and correcting the testing paper, displaying the result, analyzing the result and so on.

However, some data shows that this testing mode based on simple behavioral response has much limitation. Therefore, we introduce the monitor and evaluation based on performance. For education on internet, the easier way of evaluation is according to the student's electronic work. The designer of courses must design some structured standard of evaluation according to the instructional objectives, which named gauge. Usually, we confirm the mark ratio of evaluation from the subject, content, organization, technology, resource utilization, and prescribe the grade level of every mark ratio. This kind of gauge can greatly reduce the subjective view of evaluation. The evaluation can be made by teachers, and also, by students themselves through self-evaluation and mutual evaluation. If publicize the gauge in advance, it can lead the students on their homework.

At the end, the paper introduces the mechanism of competition and incentive, establishing a list of names to feed back the learners' learning situation, evaluating result (including schedule reminding, advice and warning) to the learners themselves by using weighting mark statistic method to measure the learners' learning time, learning content, learning interaction and learning effect each week and month, so that the learners can know their learning situation and adjust their learning process in time.

4. Consideration of the further task

4.1 To develop cooperative learning tools for research-oriented learning

We find that the BBS mode learning forum is in disorder in our practice. It is lacking of cooperation whether inside or outside the group. So we think the specialized cooperative learning tools for research-oriented learning needs to be developed.

4.2 The further research into the inside psychological process of research-oriented learning

The most profound research to the learning mechanism must go through the inside psychological process. The outside stimulation to the learners also needs penetration to their insides. It helps to hold the learners' high-level thinking to guide their research-oriented learning.

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