

## The Comprehensive Ability of Petroleum Engineering Students under Interactive Network Teaching

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### Abstract

At present, the comprehensive ability of Chinese internal students of Automation is not optimistic; the traditional class teaching system has great limitations in training students' innovation ability. The characteristics which include the subjectivity of learning, the openness of teaching environment, the interactivity of composition teaching and the diversity of teaching methods and teaching evaluation of interactive network teaching play a very important role in the training of innovation ability, information quality and the process of autonomous learning .

### Keywords

Internet environment, Engineering Students, Information quality, Innovative thinking.

### 1. The Significance of Interactive Network Teaching

The limited teaching staff in traditional teaching has to ensure that they can teach in the face of specific groups at the same time and place. Using finiteness of resources dealing with infiniteness of demand for education itself is a contradiction; its result is the education only for minority learners. Nowadays, the universalness, popularity and lifelong of education which have been advocated strongly by society. This trend also put the internet teaching that is most suitable for promoting new teaching ideas in leading edge of the education reform.

Interactive network teaching is the main form of the information teaching at present, it is an activity that using the characteristic of computer network function and environmental resources between the teaching and learning ; or it is a teaching activity in order to promoting and supporting the learning of learners by using the Internet to establish meaningful learning environment. Network teaching is not only a general sense of teaching activity, but also can't completely equal to it, especially the information has differences in the status of interactive network teaching pattern and its acquisition, transmission and using with traditional teaching mode. Interactive teaching is a kind of teaching which based on information. It ended the teaching pattern that run around teachers and classes, which was instated by network teaching centering on students' participating[1], see Figure 1.

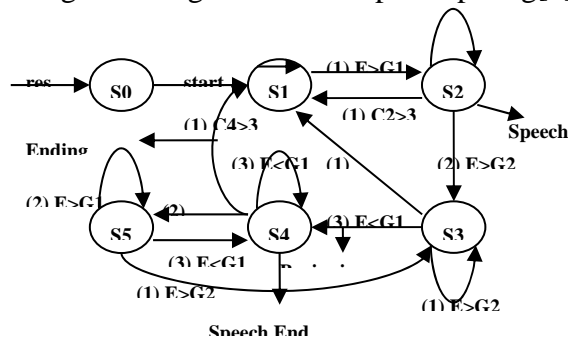


Figure1. Diagram of the energy state change

Under information network learning environment, teachers and students can search, collect, select, access to the information we needed and deal with, evaluate, develop information in the vast ocean of information. This is a kind of professional teaching method which cultivates the students' autonomous learning, finding his own subject, collecting data, solving their own problems. By reforming the combination of classroom teaching and the information network learning environment model, new teaching mode that is all-round pushing on quality education comes true. The information network is as a good environment for students' comprehensive learning information collected and published, and as the opportunity for students making a more profound learning, which can improve students' problem solving ability, practice ability and their performance ability and stimulate the students' learning motive force.

## **2. Construct the Interactive Network Teaching Environment**

The innovation of teaching mode, that is compared with imparting of knowledge theory, basing on the development of students, by changing the original "authority dependent" relationship which is between teachers and students, constructs the independent, individual cooperative and diversified new teaching mode and promotes the development of students' independent innovation, cooperative innovation spirit and ability, under the multimedia computer network environment[2].

Relying on the network courses" Signal Analysis and Application" and "Single Chip Microcomputer and Intelligent Instrument Design" set up by our major. The learning resources based on network provide audio, video, text, photo rich and colorful interactive interface for students, give full play to students' initiative and creativity in the teaching process. Finally it makes the student's master knowledge and shift innovation and application through a series of analysis, research, thinking, experimental, exchange, and inquiry activities. Accordingly it stimulates students' interest in learning, and creates beneficial condition for students to realize the exploration and discover-learning.

There aren't any advantages in interactive network teaching compared with common teaching methods. It can bridge the students' main part effect and teachers' guidance effect, making the two together. The main task is to form a kind of learning environment, and promote the development of students in the most appropriate way. Constructing the guidance of teachers, and students explore the innovation learning of the teaching mode under the interactive network teaching environment and following the teaching mode link including learning preparation, autonomous learning, cooperative learning and practice feedback evaluation on.

Depending on the innovative teaching on the network platform, it's beneficial to overcome the drawbacks of traditional teaching mode. We should pay attention to the following problems of the network teaching process: (a) teachers should actively participate in each part of teaching and adjust guidance timely; (b) teachers should pay more attention to the information technology curriculum and shouldn't ignore subject status of subject curriculum ; (c) they also should pay attention to the multimedia display and can not ignore the application of traditional media; (d) network communication should not completely replace the traditional communication patterns;(e) focus on evaluating and sharing the students' personal achievement.

## **3. Cultivate the Students' Cooperative Learning Practice Ability Based on Interactive Network Teaching**

Cooperative learning is a kind of strategy through organizing students to learn in team or group. In group cooperative activities, the individuals (students) can share the information he found and explored in the learning with the other team members and even can share with other groups or classmates. In this process, in order to achieve the group learning objectives, individuals can use dialogue, discussion, debate and other forms to sufficiently demonstrate the problem ,so that they can obtain the best way to achieve the learning objectives. Cooperative activities in learning of students are conducive to the development of students' individual thinking ability and strengthen the student's communication ability and tolerance of the student individual differences[3]. In addition, it has a

positive effect on improving the students' learning performance, forming the critical thought and creativity thought of students, treating learning content, the dealing with communication ability, self-esteem and individual respect relation between individuals of groups and so on.

The cooperative learning based on internet refers to a kind of process which uses the computer network, multimedia and the other related technology and consists of a plurality of learners point at the same learning content to interact and cooperate with each other, in order to understand and master the teaching content deeply. The cooperative learning activities based on internet show the teaching idea of "Take the student as the center", the creation of learning environment which can let the students explore autonomously, innovate autonomously and develop cooperatively. Both in class, out of class face-to-face cooperative discussions and online consultation, they have certain effect on the ability of getting, handling and transmitting information for students[4].

Learning steps of cooperative learning based on network:

(a) Grouping. Learners can make a team consists of five people according to their interests and expertise. When setting up a group, we should try to ensure that the students in the group can learn from each other, for example, the team members are heterogeneous and complementary.

(b) Clear learning objectives and tasks. After grouping, at first we should clear the evaluation standard of group goals and cooperative achievements. Secondly, the group members make a cooperation plan and the task finishing schedule through discussion and negotiation and assign the corresponding role for each person. At same time, they should also make sure each member's responsibilities and coordinate team achievements and personal achievement.

(c) Execute the plan completes the task. After dividing the tasks clearly, team members can start from different aspects and be a provider and helper of information for each other. Cooperative learning is separation and combination, together with division, it is easy to play to each student's personality and creativeness of community. Cooperation consists of group cooperation, cooperation in groups and cooperation of group members and teachers.

(d) Communicate and report achievement. Cooperative group demonstrates the learning outcomes and reports the condition of the finished tasks of group, including the description of members' contribution in the group. The concrete content includes: group exhibition, group activity plan and the condition of completed task and cooperative activities.

(e) Multiple evaluation of group cooperative learning. Evaluation of group cooperative learning includes two aspects of evaluation of learning outcomes and the cooperation process. On the group level, we can take multiple evaluation modes which are the organic combination of group-self-evaluation, group mutual evaluation and teachers' evaluation.

#### **4. Cultivate the Information Quality of Students Based on Interactive Network Teaching and Learning.**

Information quality, also known as information literacy, contains two aspects of technology and humanity significance: technically, information quality reflects the people's consciousness and ability of using information; To sum up, the information quality has five characteristics: acuity of capturing information, decisiveness of filtering information, accuracy of evaluating information, freedom of exchanging information and originality of application information.

Cultivation of students' information quality is a multifaceted, long-term process, requiring network educationist invest more manpower and material resources on constructing network environment and information environment and material resources, also need teachers who participate in the network unconsciously influence the students. As the network education, we should firstly solve the problems of students in knowledge of information quality and technology. Only in this way, the network learning can be more effective. The students who participate in network learning have advantage on cultivating information quality. First of all, network is closely bound up with information .They provide good external environment for the cultivation of students' information quality in network

learning, so that students can use technology better to solve the problem and interact with computer. Secondly, based on the related knowledge and technology, network learning has more beneficial condition to evaluate and apply information, in order to form the good information activities standard and cultivate good information quality.

Table 1 the good information activities standard and cultivate good information quality.

number	Information quality	good information activities standard
1	1.04000	0.00000
2	1.02500	0.15244
3	1.02500	0.04175
4	1.01953	-0.042
5	0.98907	-0.073
6	1.00125	-0.074
7	1.02360	0.05255
8	1.01311	-0.011
9	1.02868	0.00042

## 5. Cultivate Student's Innovative Thinking Ability Based on Interactive Network Teaching

Innovative thinking is the most basic quality of innovative talents. The key of cultivate innovative talents is to cultivate innovative thinking. In the six elements of innovative thinking structure, divergent thinking is mainly to solve the direction of thinking target, that is the thinking direction problem; dialectical thinking and horizontal and vertical thinking provide philosophy guiding ideology and psychological processing strategy for the solution of highly complex problem; imaginal thinking, intuitive thinking and logical thinking are the three basic forms of mankind thinking and it is also the main process of realizing innovative thinking. On this basis, the five links of cultivating innovative thinking includes: pay attention to the cultivation of divergent thinking, imaginal thinking, intuitive thinking, logical thinking and dialectical thinking. The comprehensive application of online resources, software and network platform can better promote the cultivation of innovative thinking.

(a) Establishing teacher's own teaching webpage or website on the campus network, teacher can carry out two-way communication with students so that teacher can speak less and the students can practice more through teacher's webpage. The students can finish the following tasks through the teaching webpage: repeat the content of classroom teaching, timely get in; read supplementary materials associated with classroom teaching, understand knowledge profoundly; continue to broaden their knowledge; do periodical self test training; test learning effect; do the answering, simulation experiment and innovation and development activities.

(b) In network teaching, the teacher search material which is closely related to the teaching content and could stimulate students' interests according to the teaching goal and the principle of creativity, practicability and novelty. Establishing related course information resource database through the network, using the comprehensiveness of subject network course to provide the opportunities of explore and solve the problems for students, teachers help students to use computer network and other media to integrate different subject content, making learning more pertinence and practicability and promoting the formation of students' problem consciousness and innovative ability.

(c) Multimedia teaching network has its unique interactive function .It can promote mutual learning and mutual exchange of students .It can provide opportunities of discovery, creation, expression for students , cultivate students' keen observation and rich imagination, form the unique knowledge structure, ensure that students can solve problems in learning successfully, understand the knowledge

deeply, complete the learning tasks successfully. In order to encourage students' innovative learning, we should pay attention to inspire students' exploration of knowledge. Multimedia network environment provide the operational platform for the students' inquiry learning. It cultivates students' innovative ability in exploration through self-study, discussion in groups, referring to data, carrying out simulative experiment and other forms.

## 6. Conclusion

Interactive network teaching, as a new teaching method and teaching means, provide new conditions for cultivating students' innovation ability, independent learning ability and information quality, using the interactive advantages of the network to bring innovation tasks and to make the students explore independently. It can both be conducive to clarifying the structure of knowledge and teach students the way of innovation. The innovation of teaching based on network teaching platform as a new thing, is in huge development and is an opportunity for every teacher. It is even a challenge for them. And only continue to go ahead, and strive to forge ahead, to keep up with the trend of the times and make due contributions to the China's modernized education.

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