



Inquiry on the “Six Processes Progressive Research-Based Teaching Mode” in Networked Environment

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Abstract

Research-based teaching is a new teaching concept which developed from the constructive learning theory, and guided by the idea “learn by doing, do by learning, learning whilst doing”. In a networked environment, to construct a teaching method consisted of 6 progressive core processes which are “doing”, “observing”, “experimenting”, “inquiring”, “imagining” and “creating”, would not only fully embody the teaching features of information era, but also enrich students’ cognitive tools make teaching circumstances more vivid. Based on the analysis of 624 middle school students’ test results, it could be seen that “six process progressive teaching mode” has significant improving effects on students’ learning interest, studying attitude, collaborative ability, knowledge level, creating and practical capacity.

Key words: Online courses; Teaching method; Research-based study

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INTRODUCTION

Research based study is a difficult and shining spot of Chinese 8th new elementary educational curriculum

reform which launched in 2001. For implementing the new method, this research has taken “six processes progressive research-based teaching mode” as topic, devote much time during September 2007 and July 2012 to do experiments in 624 students who came from 5 middle school classes and 7 high school classes. We hold that from six processes activities which consisted of “doing”, “observing”, “experimenting”, “inquiring”, “imagining” and “creating”, students would be promoted in abilities of seeking and solving problems, and could experience and feel their life. It was discovered from our experiments that there was significant improvement of students’ learning interests, learning attitudes, abilities on collaborating, knowledge acquiring, creating and practicing.

1. CONNOTATION OF 6 PROCESSES PROGRESSIVE RESEARCH-BASED TEACHING MODE IN NETWORKED ENVIRONMENT

Research-based study is a kind of learning activity which is supposed to letting students select and confirm special study topics from nature, society and life under their teachers’ guidance, so that they can gain knowledge, use knowledge and solve problem initiatively (The Chinese Basic Education Division, para.3, 2001). The nature of research-based study is launching a series of learning activities based on some special tasks, projects and topics, which was comprehensive, practical and active as a kind of comprehensive practical activity curriculum (Shi, 2002). The primary purpose of research-based study is cultivating students’ creative spirit and practical ability.

In the networked environment, six processes progressive research-based teaching mode is to take internet-focused information technology as the main instrument constructed for facilitating students’ research

studies and enriching teachers' teaching circumstance, and then applies these implements to the general teaching process. Therefore, various kinds of teaching resources, factors and procedures could be integrated and students would acquire and apply knowledge actively. Moreover, teacher can also figure out various learning problems of students during the so-called scientific education research processes. The distinctive feature of research learning in the networked environment is that learners and educators can cooperate with each other to experience the situation personally, inquire and solve problems initially. As the following, the "learn by doing, do by learning, learning whilst doing" teaching method could be carried out adequately.

2. THEORETICAL FUNDAMENTALS OF SIX PROCESSES PROGRESSIVE RESEARCH-BASED TEACHING IN NETWORKED ENVIRONMENT

Constructivism holds that learning behaviors must be occurred in specific social cultural background, that is the so-called context, rather than simply transferring knowledge to students from educators, which means that learners need to give full play to their initiative to construct meaning. Given certain social context, to combine personal experiences and other's assistance such as communication, cooperation and information exchanges between people, could learners be able to construct meaning and then acquire knowledge. Since knowledge acquiring is a series of meaning-constructing processes taken by collaborative actions between human, and only come about in a certain context, therefore, context, cooperation, dialogue and meaning-construction would constitute the four main elements of the study environment.

The internet based computer networks is the largest resource pool and knowledge repository. There are extremely abundant shared information and user-friendly interactive learning environment on the internet whose disciplinary knowledge and teaching information are organized and managed by and hypertext and hyperlink way. Especially on the basis of the development of network-based computer support cooperation system, effective environment constructing for cooperative learning has been possible. On account of the opening, inquiring and practicing features, and the flexible implementation and multiple assessment models, research-based learning could be well integrated with network-based information technology (Qi, 2005). In a word, by tremendously expanding educational boundaries of place and time limit, research-based learning has reformed the relationship between teaching and learning, enhanced students' learning interests,

efficiency and initiative adequately, moreover, it has also built a great fundamental for cultivating students' creative spirit and practical ability.

3. WHAT IS THE CONNOTATION OF SIX PROCESSES PROGRESSIVE RESEARCH-BASED LEARNING AND TEACHING MODEL IN THE NETWORKED ENVIRONMENT

Traditional classroom teaching was organized by a "presentation, understanding, consolidation, valuation" four steps model, whereas research-based learning and teaching are followed by a problem-solved model (Li, 2001). In general, the connotations of six processes progressive learning and teaching mode under networked environment are as follows:

3.1 Context Importing

In this process, there are two basically teaching requirements. On the one side, educators should encourage the fresh year students both in middle or high schools, so as to pave a way for getting background knowledge to participate in research-based learning and teaching. Moreover, gave this context, students could be induced to make a start of knowledge exploring and their ideas renewal, then got ready to make sure the targets of research-based curriculum and its significances. On another side, students should be put in questioning situations creating by educators. In the courses of new lesson teaching, educators should take advantage of multimedia courseware and network resource, create questioning situations and activate students' original knowledge reserve, so that students could get a feel of their confusions in concrete questioning situations, then give rise to questions and make a expression. Meanwhile, a detail should be paid attention that is questioning situations created by educators must contain contradiction and conflicts.

There are some key points in the teaching or guiding process. Firstly, students should be given proper guidance on how to take up scientific research. Secondly, educators have to provide adequate instruction to students on background knowledge. Especially to the fresh year students in middle school, teachers should make a series of preparations for question presuppositions, so that students could choose topics they are most interested in. Last but not least, there must be some basic instruction of internet using skills provided to students. For doing this, educators may organize variety of activities related to web applications, so as to lead students to visit some relevant websites.

3.2 Subject Choosing and Approval

During this process, there are also two basically teaching requirements. Firstly, students must choose subjects

freely according to their real conditions. They can either launch a research according to their own interests, talents and family backgrounds, or choose a topic given by educators. Secondly, students have to learn how to collect data and demonstrate questions, and then define a selected main topic from questions they have found. Let students to collect data, to demonstrate questions they try to study, and then to make a decision what the final topic they will choose to study.

As regards to the guidance from educators, four key points should be paid attention on. The first one is that educators must teach students how to find, demonstrate and choose a topic. The second is to help students make sure what kind of methods will be used to study their topic. Thirdly, students are asked to think over their topics. Finally, students must find the initial access to look up their subject literature. Under the guidance of teachers, students are asked to start from the issues they care about, and to search the literature to demonstrate their topics, through the channels such as libraries and museums. In addition to these, they should also demonstrate their topics via the internet, collecting, filtering out information relevant to the issues. If their topics need to be searched of patent literature, students are asked to search it on the internet through a patent search site. If some school has good conditions, students are required to search literature on their subjects by using the CD-ROM databases.

3.3 Research Plan Developing

There are three basic requirements of teaching. The first one is to set up a subject research group. Ideal subject research group is a place where there are heterogeneous between members, but homogeneous among groups. In general, a subject group is consisted of three to five members, based on the principles of voluntary combination and appropriate adjustment. The second one is to develop a research plan under the leadership of the leader. Generally, a research plan should include the purpose and meaning, the main content of research project, the research steps, progress, methods and research results. What's more, it's important to make a clear labor division of the members based on their issues. The last one is to design learning community. Set up a mentor network alliance, so that every teacher or the people who are keen on education can register as a mentor on the network platform, and then accept or select the help requests from any of the students. Meanwhile, students are free to choose a suitable teacher and file of an application. There are some teaching guidelines teachers should pay attention to. Firstly, teachers must teach students how to set up a research group, and develop a research plan. Secondly, teacher must guide students to write a thesis proposal, and provide students the guidelines about the skills, manners and mentality of these defenses. The next one is to help students revise and improve the research project. Selecting the appropriate method of online

learning tools is the fourth one, such as using literature research method and making a concrete plan to search literature on the internet. In fact, many word processing software are excellent tools. For example, students can upload their designed thesis proposal by using FTP, so that the tutors can feedback their comments and suggestions to the students through E-mail and message board, and promote a question-and-answer session online. In addition, adopting BBS discussion area makes the ideas of learning and counseling acrossing school come true. The last but not least is the guidance about how to choose a tutor.

3.4 Teaching Guidelines

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3.5 Practice Research

As regards to educators' guidance, two key points should be paid attention to. The first one is to collect information about the issues. There are many channels for students to collect information, such as doing experiment, making a survey, visiting experts, developing a on-the-spot investigation and so on. Moreover, they can also search relevant literature through library and internet. Secondly, the collected information should be further discussed and researched among group members, and the members should exchange ideas each other, and then revise and improve their research project.

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As for teachers, there are some main points of teaching instruction should be noticed. Firstly, teacher should teach students how to adjust their mental pressure and how to make and implement their stages of learning objectives. The second is to help students choose the best research methods. Thirdly, what student must learn is how to record, sort, filter, and classify the information, such as classifying and organizing the project information by computer. Fourthly, students should know how to make cooperation with each other, and adjust their research plans. The next one is learning how to prevent accidents. Finally, students are directed to collect, analyze, reorganize their topic information. “With the rapid rise of a new generation of social software in the network age, such as BBS, MSN, Blog, Wiki and so on, the needs of independent development and exchange of groups are fully met.” (Li, 2005) Around the real issues, students can make it clear by consulting their subject information on the internet. Meanwhile, students can use Email for two-way asynchronous communication, and make interactive discussions with experts and mentors via BBS, Blog, also, they can create a QQ group and carry out mutual exploration.

3.6 Information Analyzing and Processing

There are several basic requirements of teaching: The members of the research group should make reorganization, classification, analysis and summarize on the collected information, and then extract the regular conclusions, and put forward a proposal.

The key points of the teaching instruction are consisted of three parts. First of all, teacher should help students to present their research findings in the best way. Secondly, teachers should teach students how to design a plan of concluding reports. When students make reorganization, classification, analysis and summarize on the collected information, they are required to spare no effort to make full use of the aided research tools of statistic analysis, word processing and spreadsheet software, such as SPSS, SAS, BMDP, FoxBase, Excel and so on, and then carry out the questionnaire and survey data processing and statistical analysis.

3.7 Results Communication and Present

The basic requirements of teaching: the members of the research group arrangement, classify, analyze and generalize the collected information, and extract the regularity of the conclusions, and put forward their own proposals.

The key points of the teaching: a) The guidance of the best performance of the research results. b) Guidance of the method to complete the subject. c) Guidance of the selection and use of the auxiliary research tool. In the

information material collation, classification, analysis and generalization, the students should use statistical analysis, word processing, spreadsheet software and other auxiliary research tools, for example, the application of SPSS, SAS, BMDP, FoxBase, Excel and other software, and the processing and statistical analysis of the questionnaire and survey data.

The basic requirements of teaching: a) To display, exchange and promote research results. The research group shows research papers, charts, models, investigation report, etc. using the panels, wall posters, publications. b) Summary and evaluation. Through exchanges, collisions among students, students can enhance the awareness and emotion, and do comprehensive summary, introspection and evaluation. c) Making open reply.

The guiding points for teaching: a) Guidance of writing skills of the report. b) Guidance of the exchange of results. c) Guidance of the respondent skills. D) Guidance on the matters needing attention to complete the subject. e) Reflection on the problem after completing the subject. g) Guidance of students’ awareness of intellectual property rights. h) Guidance of promoting research results. i) Guidance of formative evaluation methods. j) Guidance of publishing research production.

At this stage, the students make full use of word processing software and electronic form software to deal with the subject results, and use the information exchange platform to manage, exchange and evaluate. For example, publishing research results in the “web site”, students can show themselves to achieve worldwide communication; Communication and discussion can be achieved by creating class Blog community and some Blog alliance of schools, research studying Blog and so on; by BBS electronic forum, students can present the ideas, process and their confusion, sharing learning resources, process, results between students; using Access database keep record the discussion between the teachers and students, students and students, achievements, visiting, experiment and investigation process and results for teachers and students evaluation.

4. EFFECTS OF SIX PROCESSES PROGRESSIVE RESEARCH-BASED TEACHING MODE IN NETWORKED ENVIRONMENT

From September 2007 to July 2012, the “Six Processes progressive” Research-based Teaching Mode” in Networked Environment was used in five junior high school classes, seven high school class, resulting 624 students were involved in the experiment. Letting the student to discover and solve problems through a series of activities, like “do” and “investigation”, “experiment”,

“exploration”, “imagination”, “creation” and so on. Students’ interest in learning, attitude of learning, cooperation ability, level of knowledge, innovation ability and practice ability will be improved significantly. Outstanding performance in:

4.1 Students’ Interest in Learning Improved Obviously

Questionnaire survey showed that 95.8% of the students are fond of the “six processes progressive research-based teaching mode” under the networked environment, there was significant difference before and after the students actively participate in research learning, 46.2% and 88.5%, respectively. Thus, the Six Processes Progressive Research-based Learning and Teaching Mode in the Networked Environment have greatly improved the students’ interest in learning. When the students happy to learn, it is much easier and more effective than been forced to learn. Interest is the best teacher, students will take the initiative to seek knowledge, to explore, to practice, and have the happy mood and experience in the process under the excitation of interest. Because of its abundant resources, the Six Processes Progressive Research-based Learning and Teaching Mode in the Networked Environment broaden the student’s field of vision, enhances students’ learning desire, also to enhance the students’ interest in participation and exploratory learning.

4.2 Students’ Ability to Acquire Knowledge Improved Greatly

Under the network environment through the Six Processes Progressive Research-based Learning and Teaching Mode, students learn to search engine and the method of processing information smartly and efficiently, thus, to provides a rich “research subject”, all-round, multi-level and multi-angle, illustrated “literature” as well as a variety of “ideas” to solve the problem for the students in the Research-based learning (Ding, 2003). Compared with the traditional mode, it greatly improves the efficiency and the breadth of students searching for information, also enables the students to make full use of network resources reasonably. The survey also found that 96.7% of the students think that in this kind of teaching mode, their ability to collect information, especially the ability to analysis of information, to process information has a lot of ascension, besides, the acquisition of knowledge, the ability to seek knowledge.

4.3 Students’ Cooperation Ability Has Improved Significantly

Cooperation is one of the basic forms of human interaction, is an important power to the existence and development of human society. Under the network environment through the Six Processes Progressive

Research-based Learning and Teaching Mode, the way to solve this difficult problem has changed, from the past only to ask the teacher to give priority to peer collaboration, mentoring is complementary. That is not only to mobilize the students’ learning enthusiasm but also to improve the ability of communication and cooperation (Li, 2005). While students through discussion and probe in the choices of subjects or topics, with the junior students also can undertake its thinking, the depth and breadth of teaching thinking get promoted. In the survey, 92.3% of the students indicate that the attitudes of the collaboration have improved obviously, and also the ability to communicate is obviously enhanced.

4.4 Students’ Innovation Spirit and Practice Ability Significantly Increased

The survey found that 91.3% of the students think it improves the ability of scientific research and increases practice ability significantly. Innovation ability of students in there is significant differences after the experiment. In the depths of the person’s psychology have an ingrained need, it is to want to be a discoverer, researchers, explorer, and in the spiritual world of teenagers that need particularly strong. The Six Processes Progressive Research-based Learning and Teaching Mode Under the Networked Environment broke the hegemony, changed the way and content of the principle, and the standardization and uniformity of the cultural production process is lost, but the subject’s uniqueness and creativity to be confirmed (Zeng, 2011). There all have been no ready-made consultation from the subject or project selection, consultation, to the topic research, or project results expression and so on. It is a series of activities that take the research as the core. This task driven approach to learning encourage students to think and research like scientists, also to bring students study experience and success of pleasant sensation, enhance the students’ study confidence and get into the habit of studying. Through practices, cultivating students’ consciousness and habit of ready to start to work, diligently practice, enhance students’ practical ability and practice ability. The way to get useful knowledge from the Angle of the problem analysis and problem solving improve the ability to use knowledge to solve the problem.

CONCLUSION

Based on the analysis of 624 middle school students’ test results, it could be seen that “six processes progressive teaching mode” has significant improving effects on students’ learning interest, studying attitude, collaborative ability, knowledge level, creating and practical capacity.

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