

Research on Individualized and Precise Stratified Teaching of Information Technology Course in Primary and Secondary Schools

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Abstract: The information technology course in primary and secondary schools undertakes the important task of training the application ability of information technology of students in China. Stratified teaching as a teaching mode to improve the teaching quality of information technology education has attracted more and more attention. But in the actual teaching, stratified teaching has not been widely applied and it has not been worked as it should be in improving the teaching quality. In view of the existing problems in stratified teaching, the paper probes into the stratified teaching strategies of primary and secondary schools from the perspective of personalized learning, and puts forward to the main principles of stratification, as well as makes a specific analysis from three aspects, namely, learning objectives, teaching activities and teaching evaluation.

1. Introduction

Information technology course in primary and secondary schools undertakes the important task of improving the information literacy of the students. Due to the consideration of teaching efficiency, there are many over homogenization problems in the teaching of information technology course, such as teaching objectives, teaching methods and evaluation methods. Stratified teaching, as a way to solve this problem, has been discussed by many scholars, such as scholars Li Yan and Wang Honglu put forward a stratified teaching strategy of "one principal and three subordinates, which has a great influence on the theoretical research of stratified teaching. Aiming at the problems existing in the current course, the paper explores and practices the stratified teaching mode, hoping to provide references for the new round of basic education and teaching reform.

2. Teaching Problems and Causes of Information Technology Course in Primary and Secondary Schools

China's educational informationization has entered the stage of 2.0. Due to the great attention paid by the state to the construction of it, the basic work has made remarkable achievements in the past decade. Computer, Internet, multimedia classroom and other hardware facilities and equipment are no longer the main problem of affecting and restricting the information technology course in primary and secondary schools. However, there are still some problems in the actual classroom teaching process, which are mainly embodied in the following two aspects of content and form:

The first is the pertinence of the information technology course content in primary and secondary schools. At the beginning of the development of the information technology course in primary and secondary schools, the teaching mainly solve the problem of "have or haven't". It mainly takes "tool view" as the guiding ideology. Information technology is more used as a basic tool for students' future work and life. With the rapid development of China's basic education information, the

computer level of primary and secondary school students has improved rapidly and the traditional teaching content has been unable to meet the needs of the students. The teaching of information technology in some schools is still at the basic operational level, such as the teaching of software OFFICE etc. In the era of intelligent technology, students just with basic information literacy can't meet the needs of the future society. The school's information technology course needs to cultivate students' computational thinking, as well as innovation and practical ability with STEM as the core.

The second is the "rigid" problem of the teaching model of information technology course in primary and secondary schools. In the "Internet+" era, learning has become rich and diverse, and a variety of network based on learning models has challenged the traditional teaching. The new learning concepts such as MOOC, flipping class, mixed learning and intelligent learning should have a great impact on the students and teachers in the classroom. However, the traditional teaching mode which combines teaching and practice still dominates the classes of information technology course in primary and secondary schools and not adapted to the changes of the current intelligent era.

3. Basic Principles of Precise Stratified Teaching under the Personalized Learning Concept

Tagg (2003) pointed out that teaching should be considered from the perspective of who are learners and how to advise them to learn, rather than focusing on teaching content at the beginning. The precise and stratified teaching design under personalized learning concept is based on the following two main principles:

3.1 The "Diversity and Unity" Principle of Personalized Learning Content

As the subject of learning, the learner has its own learning habits and characteristics because of the different subject background and the growth environment. The choices of teaching content must be rich and diverse, for example, to design some teaching questions related to society and life, which can teach students how to solve the problems encounter in reality and in future with the computer foundation knowledge, and give students the consciousness of "Learn in order to practice". But diversification does not mean fragmentation of knowledge. Teachers should train students to build their own knowledge structure and system with systematic design ideas, emphasizing on the application of methods, rather than just grasping the fragmented knowledge.

3.2 The Personalized Learners' Independent Selection Principle

The ultimate goal of precise stratified teaching is to provide the maximum feasibility for the development of students' differentiation and individualization. Whether the content and form of teaching can be provided to students to the maximum of selectivity is an important index to measure the effect of stratified teaching. Under the guidance of teachers, students determine the learning content and methods by "independent selecting" within limits. Teachers are responsible for providing "scope of choice" for students, as well as giving advice and making classification guidance for students of different foundations. Stratification is determined by teachers' comprehensive consideration which is based on students' professional, foundation and attitude, but students themselves do not know which level of knowledge they are learning. There shouldn't be clear boundaries of the contents in each level. Students can not only choose difficult learning module, but also can choose the minimum standard of learning module. Precise stratification is not the purpose of teaching, but a means to improve the teaching quality. Therefore, score is not the way to measure the development and progress of the students, but the development and progress of the students themselves is.

4. The Precise Stratified Teaching Strategy of Information Technology Course under the Personalized Learning Concept

The purpose of personalized precise stratified teaching is to pay attention to the individualized learning of the students. As the goal and subject of the stratified teaching, students are the most

important factors. In stratified teaching of information technology course, students should be taken as the design center, mainly including the precise stratified of learning aims, teaching activities and teaching evaluation, which are corresponding to the main content of the three main stages of teaching design, implementation and evaluation in the teaching process.

4.1 Precise Stratification of Learning Goals

Learning goal is an important factor of students' learning effect. The scientific and rationality setting of learning goal play a decisive role in students' learning outcomes. When carrying out the goal stratification of information technology course, the course characteristics should be taken full consideration and the advantages of information technology should be developed. At the same time, the guiding role of students' interest and attitude should be focused, rather than only limited in the learning content and the process. The classification of students' learning objectives is a comprehensive system. In the classification of learning objectives, there are not only the intuitive and observable direct goals should be focused, but also the long-term goals that need to be presented indirectly and cannot be observed directly should be paid attention to. At the same time, full consideration should be taken to the extent of how much the students can reach their goals. For different level students, their goal completion degree is also different. There shouldn't be significant gap between different levels of objectives, gradual transition should be made between all levels of objectives, so that it can be easily accepted and understood by students.

4.2 Precise Stratification of Teaching Activities

Constructivist teaching concept emphasizes that students are the main body of the teaching activities, and the students should be given as many independent and effective activities as possible in the teaching process. On the basis of referenced constructivist teaching thought, taking the participation of subjects and the creation of situations as the guiding ideology of instructional activities design, information technology course teaching activities should be decomposed into four stages: task arrangement, problem posing, group learning and practice publishing.

4.2.1 The Stage of Arranging the Task by Teachers Accurately and Hierarchically

At this stage, teachers need to arrange the task accurately and hierarchically by choosing tasks that are similar to students' profession, life, interests and hobbies on the basis of analyzing their learning contents deeply. These tasks can neither be too complicated nor too simple. Students' basic knowledge and their "Recent Development Zone" should be taken into account. The stratification level should be from easy to difficult and allow students to choose according to their interests and hobbies, rather than too obvious. For example, on the World AIDS Day, teachers can let students master the current situation of AIDS in Asia and show the current status and trends with charts. Through the task, students can understand the basic situation of AIDS and know well about the way of AIDS transmission. They can use the information search method that has been mastered and do statistics and analysis of the data, as well as learn how to make and use the multiple charts. The process of completing tasks is to complete the process of learning objectives assigned by teachers. Teachers should require students to choose different levels of tasks and complete by themselves on the premise of completing the simplest tasks.

4.2.2 The Stage of Discussing and Putting Forward Problems by Students

In this stage, students analyze the tasks hierarchically and discuss in a group, and finally form the problems that need to be solved. Only asking questions are the real initiative for students to participate in the study. The process of students' questioning is also a process of deeply thinking by the students themselves. In this way, students ask questions, analyze questions and solve the problems. Teachers as collaborators analyze the problems and illustrate students the importance of the problem. Moreover, they guide students to put forward ideas and methods to solve the problems, and further pointed out that the knowledge and ability which should have in the process of solving the problem. Teachers should give full play to the role of inspiration and guidance, and let more students participate in the learning activities. Furthermore, teachers should make the most

appropriate comments according to the different questions raised by the students.

4.2.3 The Stage of Cooperative Learning In Groups

There are two main factors that influence cooperative learning in groups: one is the interest and the degree of students' participation; the other is the knowledge and ability foundation that students already have. Teachers should fully participate in the learning process of students, and discuss with students so that students of different levels and foundations can get the proper attention. At this stage, teachers can choose some students with better foundation as "assistant teachers" of cooperative learning, so as to make up for the problem of teachers busying with their work in class, so that students of different levels all can get development.

4.2.4 The Stage of Reporting In Accordance With the Degree of the Task Completion.

2-3 students should be chosen to do the report every time, but it should be finished by different students, so that every student has the opportunity to practice. The process of reporting is an important part for students to organize their ideas and finish the final step of the task. It is also an important way to show the results of class learning. It is not necessary to do the report in every class. Teachers can make necessary adjustments according to the arrangement of teaching contents, but they must summarize and feedback students' learning results in time. This stage is the process for the students of different levels to participate in. Teachers should pay attention to the students of different levels, especially to the students whose learning interest is not high. Teachers should analyze the main reasons and guide them to strive for the learning motivation.

4.3 Precise Stratification of Teaching Evaluation

Teaching evaluation is used to evaluate the achievement of students' learning goals. It's a means to test the students' learning effect. The stratification of teaching evaluation is related to the stratification of teaching activities. Due to the particularity of the stratified teaching mode of information technology course content in primary and secondary schools, full consideration about how to carry out the evaluation should be taken before designing teaching activities. This kind of evaluation, which is called reverse design or backward forward design, is prior to the design of teaching implementation. The practice shows that the thinking of reverse design is very helpful to improve the teaching effect. In the process of teaching based on reverse design, teachers are as a learning collaborator to teach. On the specific evaluation index, teachers should adopt a diversified and three-dimensional comprehensive evaluation system according to the setting of learning goals. Teachers can evaluate students' learning from many aspects, such as mastery of knowledge and skills, ideas and methods of problem-solving, communication and cooperation in team work, as well as comprehensive practice.

5. Summary

Through the in-depth study of the information technology course in primary and secondary schools stratified teaching and the application of the teaching practice, good results are achieved in the practical teaching, which effectively solved the problem of poor teaching quality caused by students differences and it also realized the goal of promoting the all-round development of students. However, due to the influence of objective factors such as the quality of teachers and the reasonableness of school teaching arrangements, there are still some problems in the specific operation and implementation of stratified teaching. Teachers, as the main body of the teaching mode reform still have many difficulties in the practical teaching, but as long as the class is student-centered and the teachers strive to improve their own quality and ability, as well as continuously improve their teaching mode and method, more compound talents with high quality will be cultivated in the future.

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