ISSN: 2688-8653

Research on Hierarchical Teaching of Physics in Senior High School under the Background of New College Entrance Examination

Jun Chen

School of Physics and Electronic Engineering, Taishan University, Taishan, Shandong 271021, China

Abstract

Hierarchical teaching means that teachers scientifically divide students into several groups according to their existing knowledge, ability level and potential tendency, and adopt different teaching methods. This paper studies the application of hierarchical teaching in senior high school physics teaching from the aspects of preparing lessons at different levels, attending classes at different levels, arranging homework at different levels, tutoring students at different levels and testing at different levels.

Keywords

Hierarchical Teaching; High School Physics; Teaching Method.

1. Introduction

In the 2021 new college entrance examination policy, liberal arts and sciences are not divided into different subjects, and the "3+3" model is implemented in many places. In response to the urgent need of today's society for cultivating specialized talents in the technical field, physics is one of the preferred subjects for students, and it is also an important subject for drawing scores in the examination. As we all know, physics is a subject with strong logical thinking ability. Different students have different ages and physiological characteristics.There is a great difference between the ability to master knowledge and the ability to analyze problems. It is not feasible to use the traditional one-size-fits-all teaching mode to teach students, while hierarchical teaching is an effective real-time teaching strategy under the educational concept of taking into account students' needs at different levels and aiming at students' sustainability and benign development. Under the background of the new college entrance examination,There are considerable differences in physics learning objectives in senior high schools, and it is a topic that physics educators need to constantly explore to explore teaching methods suitable for students at different levels.

By studying the various educational reform programs issued by the national education department and studying the literature about stratified teaching research, this paper studies the stratified physics education research in senior high school from the following five aspects: preparing lessons at different levels, attending classes at different levels, including asking questions in class, assigning homework at different levels, tutoring students at different levels and testing at different levels.In this way, the stratified teaching of physics in senior high school is beneficial to teaching students in accordance with their aptitude, adapting to students' abilities and requirements, and solving individual differences among students.

ISSN: 2688-8653

2. Analyze the Reasons of Stratified Physics Teaching in Senior High School

Physics knowledge in senior high school is systematic, highly relevant, and requires solid mathematical calculation ability and high logical analysis ability. Generally speaking, physics knowledge in senior high school and physics knowledge in junior high school are different in difficulty, not at the same level. The contents learned in junior high school are all basic, which briefly introduces the physics knowledge in life.Let students have a preliminary understanding of physics. Senior high school physics pays more attention to in-depth and systematic study. Senior high school requires students to find problems related to physics, express them accurately from the perspective of physics, understand the significance of finding and raising problems, and understand the importance of conjecture and hypothesis.Learn scientific test methods and ways to accurately process data. Generally speaking, junior high school physics to senior high school physics is a transition from simple logical thinking of single factor to complex logical thinking of multiple factors (including analysis, induction, reasoning, hypothesis, etc.).

Therefore, due to the unbalanced development in psychological development level and the differences in students' physics foundation and learning ability, senior high school students will inevitably face the phenomenon of multi-level differentiation in learning when they enter senior high school. Therefore, only by means of stratified teaching can we fully take care of the differences in students' development.Able to teach students in accordance with their aptitude.

3. The Concrete Development of Stratified Teaching of Physics in Senior High School

3.1. Layered Lesson Preparation

First, first understand the basic situation of students; In order to prepare lessons smoothly and better, the first step is to know each student, fully grasp how much knowledge each senior high school student currently stores, what level their knowledge has reached, and find out the specific situation of their psychological and physiological development level.

Second, let all students master the basic knowledge; When teachers prepare teaching objectives, namely knowledge and skills, process and methods, emotional attitudes and values, the first thing to do is to improve the basic knowledge level of all students to a certain extent, so that students can at least understand the basic concept definition and lay the foundation for the subsequent learning content.Of course, we must leave room for students with strong learning ability to think and develop.

Thirdly, study groups should be designed for the teaching process. When preparing for the teaching process, teachers should not prepare the same topic for all students to solve. Instead, they should carry out group activities according to the actual situation, and the divided groups should solve different problems. Several groups with strong learning ability should let them solve some relatively thinking problems.While the study group with poor foundation designs other activities and problems for them.

Fourthly, we should design the teaching link according to the students' life. Teachers should give students correct guidance and quality education according to students' living environment, learning environment and combining with some real-time hot things in the society, so that students with poor learning foundation can be interested in learning physics.It can also enable students with strong learning ability to have a deeper grasp and insight into the physical knowledge they have mastered.

Fifth, master the contents of the syllabus; When preparing lessons, teachers must be fully familiar with the contents taught in class, express all knowledge points accurately, presuppose

ISSN: 2688-8653

possible problems in class, and highlight important and difficult points in class, so as to allocate time reasonably and scientifically and improve the quality of classroom teaching.

3.2. Layered Classes

The teaching thought of "teaching students in accordance with their aptitude" put forward by Confucius is still very used in the 1920s, which shows that "teaching students in accordance with their aptitude" is a universally applicable law in teaching.

In hierarchical class, we should first master the knowledge from top to bottom, let the students have an overall understanding of physics in senior high school, and then put the teaching content in this background to guide the students to understand it, which will have different effects. Secondly, in the classroom, students' learning progress is always inconsistent. At this time, teachers should make progress backward.Control your desire to go on talking, make students think independently, and spare time for students to ask questions. If there are common problems, teachers will explain them in a unified way. If the problems are different, teachers will listen carefully and give scientific answers in different ways of thinking. In this way, hierarchical teaching is implemented.

3.3. Layered Assignment

First of all, we assign homework to further consolidate the knowledge that students have learned. Both students with good physical foundation and students with poor physical foundation can recognize their own shortcomings and stimulate their upward enterprising spirit.

For students with relatively backward learning foundation, the difficulty of homework can be appropriately reduced, and some exercises similar to the examples mentioned in class can also be arranged, so that they will be more confident and interested in homework and achieve basic goals.

For these students with medium learning foundation and medium learning ability, some variant exercises of after-school exercises can be arranged slightly, and some comprehensive exercises with less difficulty can be arranged. In this way, the basic teaching objectives can be achieved while ensuring that students master basic knowledge and basic skills, and students can also make progress upwards.

For students with good learning foundation and strong learning ability, they can appropriately increase the difficulty of homework according to the actual situation, arrange more comprehensive questions and some innovative exercises, so that these students can broaden their knowledge, further improve their problem-solving skills and develop their creative thinking.Make their comprehensive ability have a certain degree of improvement.

3.4. Layered Tutoring Students

In order to put an end to the phenomenon of "not enough to eat" and "not enough to eat", it is essential to give students stratified counseling. To treat students with different foundations, we should teach students in accordance with their aptitude and be persuasive, so that students at all levels can develop in an all-round way.

First of all, teachers need to embrace students at every level with sincere, sincere, warm and selfless love. As the saying goes, "Without love, there is no education". As the blood of education, love must be possessed by every educator. It is necessary to integrate motherly and friend-like love into every stage of the teaching process, so that students can have a warm learning environment.Then study happily with low pressure and low burden, and constantly grow into a pillar of the country.

Secondly, teachers should stimulate students' interest in physics as much as possible. Teachers should face up to the individual differences of high school students, and try their best to make

ISSN: 2688-8653

students at every level have the best and greatest training and promotion. Praise and encourage students so that they have enough self-confidence in dealing with physics problems. For students with poor foundation, we should be persuasive,Patiently guide them to solve problems, so that they can finally acquire knowledge and solve difficult problems in person, enhance their self-confidence and increase their interest in physics; For students with medium foundation, when they understand and acquire new knowledge, teachers should give timely praise and affirmation to stimulate their enthusiasm and initiative in learning new knowledge of physics. For students with a good foundation,Always encourage them to explore new problems and find new solutions, so that they can further consolidate their knowledge and strive to improve themselves.

3.5. Layered Detection

Hierarchical testing is to better promote students' self-development and create a platform for students' self-confidence. In fact, hierarchical testing pays attention to the relative evaluation. There are obvious differences among senior high school students, and their learning ability is good or bad. Students at each level have different relative learning objectives, so the evaluation of students should naturally pay attention to relativity.After teaching new knowledge, teachers should test students in layers in time, and design the test questions into three types, the first is the basic questions with ordinary difficulty, the second is the routine questions with moderate difficulty, and the third is the application innovation questions with higher difficulty. Each student can choose the test questions independently according to their own learning situation and ability level.

4. Advantages of Stratified Teaching of Physics in Senior High School

Students, especially senior high school students, have great differences in learning ability, knowledge level and thinking dispersion ability. Under the background of "3+3" in the new college entrance examination, physics has become a necessary choice for most students in order to ensure that they are admitted to their favorite majors. For the difficult subject of studying physics, hierarchical teaching is not only the helper of teachers' teaching.It is also the savior of high school students studying physics. First of all, stratified teaching can take care of students with different foundations, consider the different physical foundations of senior high school students, prescribe the right medicine and find the right focus, which can better implement teaching students in accordance with their aptitude, and make all students get suitable and optimal development; Secondly, the implementation of hierarchical teaching can make teachers take better care of students at every level.It can allocate the effective classroom time more scientifically and reasonably, improve the efficiency and quality of physics teaching to a certain extent, and reduce the pressure of physics teaching workers.

5. Conclusion

5.1. Research Results

From the content of this article, we can see that the new college entrance examination is an inevitable trend of educational reform, in order to better select talents, let each student find a life direction suitable for himself and achieve "promoting talents according to their suitability". With this, the subject selection of the new college entrance examination has also been pushed to the hot spot. Physics, as the cornerstone of high technology, is the condition for most colleges and universities to enroll students.This makes physics one of the preferred subjects for high school students after the new college entrance examination. Under the background of the new college entrance examination, stratified teaching is the inevitable trend of physics teaching in senior high schools. It can better implement the teaching for all students, solve the problem of

ISSN: 2688-8653

obvious individual differences among senior high school students to a great extent, and better teach students in accordance with their aptitude.

References

[1] Zhang Haidong. implementation approaches and cases of middle school physics teaching based on problem-solving theory [J]. reference of middle school physics teaching, 2016(16):10-15.

[2] Xu Panlin. Research on the Application of Hierarchical Teaching Method in Physics Teaching [J]. The Road to Success, 2016(32):69-72.

[3] Zhang Xiangzhou. Exploration of physics teaching mode under the background of stratified shift system of compulsory courses in senior high school [J]. Exploration of physics teaching, 2015, 33 (475):1-5.

[4] Wang Wei. Teaching according to learning and teaching students in accordance with their aptitude-On the application of hierarchical teaching method in physics teaching in senior high schools [J]. Reading and Writing (Education and Teaching Journal), 2017,14(04):120-128.

[5] Huang Zhonghan, Huang Xinyi. Implementing "dynamic grouping teaching" in middle school physics teaching [J]. Discussion on Physics Teaching, 2009,27(3):65-66.

[6] Ding Hong. Analysis of the problems and countermeasures in physics teaching in senior high schools [J]. Examination Weekly, 2014,69:141-142.

[7] Song Hua. Talking about the stratified teaching of physics in senior high school under the new curriculum reform [J], Urban Tutoring (second half), 2010(6):8-20.