

An Analysis of the Application of Curriculum Thinking in University Physics Experiments - The Hall Effect Experiment as an Example

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Abstract: By reviewing the curriculum ideological and experimental principles, this paper analyzes the methods, students' participation and experimental results of applying curriculum ideological and political to the physics experiment taking the Hall effect as an example, and finds that the application of curriculum ideological and political can effectively improve the experimental results, increase students' participation awareness, and promote students' comprehensive understanding of the experimental principles. Therefore, in the future college physics experiments, the application of curriculum ideology and politics can bring more benefits.

1. Introduction

Hall effect experiment is an important experiment in college physics experiment, which aims to test students' mastery of magnetic knowledge. During the experiment, the intensity and direction of the magnetic field are determined by measuring the current change in the experimental heating tube, so as to observe the magnetic phenomenon. The experimental results show that when the experimental heating tube is not affected by the magnetic field, the current does not change; When the direction of the magnetic field is changed, the current in the experimental heating tube will also change. Therefore, Hall effect experiment can be used to verify students' understanding of magnetic principle and its influence on current^[1].

Hall effect experiment is a common kind of experiment in physics experiment class. It uses a very weak magnetic field to produce an effective current to explain the relationship between current and magnetic field. Hall effect experiment not only inspects students' experimental ability, but also improves students' thinking ability. More importantly, it helps promote the ideological and political development of curriculum in university education^[2]. First of all, the Hall effect experiment can cultivate students' scientific thinking and analytical ability, let students master the methods of physical knowledge and deepen understanding. Secondly, in the process of experiment, students can also experience relevant concepts from the practice of physical knowledge, such as mechanical principles, conservation of energy, etc., which can stimulate students' thinking and contribute to the ideological and political development of the curriculum^[3].

When conducting Hall effect experiment, physics teachers must have professional quality. Only through in-depth ideological analysis and familiarity with the whole process of the experiment can

we effectively implement the curriculum ideological and political in the physical experiment. At the same time, physics teachers should also enhance students' awareness of physics learning, so that students can have a deep understanding of the importance of ideological and political courses in the Hall effect experiment^[4]. Therefore, curriculum ideology and politics play an important role in the Hall effect experiment. In order to make the Hall effect experiment succeed, we must achieve the ideological and political teaching strategy based on the experiment and adjust the teaching content in time; Carry out the application research of curriculum ideology and politics in the Hall effect experiment; Combined with the changes of experimental variables, gradually enhance students' understanding of curriculum ideology and politics; Evaluate the experiment effect in time.

2. Ideological and political courses in college physics experiments

2.1. Ideological and political courses improve students' ideological and political quality

It is emphasized that "curriculum ideological and political" should have distinctive characteristics such as teacher's moral style, political orientation, professional ethics and core values; Based on the curriculum, it proposes to promote the "curriculum ideology" and effectively improve the political education level of college students through the combination of indoctrination and infiltration forms, theoretical education and practical education, history and reality, explicit education and implicit education, and positive education and discipline education^[5].

2.2. How to reflect curriculum ideology and politics in college physics experiments

Curriculum ideology and politics can be embodied in college physics experiments through the following methods. First, emphasize scientific spirit. In college physics experiments, teachers can emphasize the importance of scientific spirit, such as questioning, experiment, verification, reasoning, etc. These scientific spirits are indispensable in the process of scientific research, and are also the key to cultivate students' thinking ability and innovation consciousness. At the same time, teachers can teach students to conduct experiments in a rigorous and honest manner, and not fabricate data or plagiarize others' achievements. Second, it involves social problems. College physics experiments can involve some experiments related to social problems, such as environmental pollution, energy utilization, etc. These experiments can guide students to realize the close relationship between science and technology and social development, as well as the impact of science and technology on social development. At the same time, it can also guide students to think about the sustainable development of science and technology. Third, to guide students to think, college physics experiments can design some experiments that require students to think independently, such as designing an experimental instrument to solve a practical problem. These experiments can cultivate students' innovative consciousness and practical ability, and also guide students to think about the relationship between science and technology and social development^[6].

3. The application of curriculum ideology and politics in college physics experiments

3.1. Requirements of college physics experiment on students' practical ability

The purpose of college physics experiment is to enable students to master the theoretical knowledge of physics and cultivate their practical ability and scientific research ability. The following are the requirements of college physics experiments on students' practical ability. Preparation before the experiment: students need to understand the purpose, principle and steps of the experiment, master the instruments, materials and operation methods required for the experiment, formulate the experiment plan and carry out the necessary pre-experiment^[7].

Instrument operation ability: students need to master instrument operation methods, set instrument parameters correctly, and ensure the accuracy and reliability of experimental data. Experimental data processing ability: students need to process, analyze and interpret experimental data, including data sorting, statistics, chart drawing and error analysis. Evaluation ability of experimental results: students need to evaluate the effectiveness and feasibility of experimental results based on experimental data and theoretical knowledge, and propose improvement plans. Experiment safety awareness and emergency handling ability: students need to understand the laboratory safety regulations and operating procedures, master emergency handling methods, and ensure the safety and smoothness of the experiment process. In general, college physics experiments put forward higher requirements for students' practical ability, requiring students to have a solid theoretical foundation, flexible thinking ability and rigorous experimental attitude^[8].

3.2. Curriculum ideological and political education promotes the cultivation of students' practical ability

One of the goals of curriculum ideological and political education is to promote the cultivation of students' practical ability. In this context, practical ability refers to the knowledge, skills, and attitudes that enable individuals to actively engage in society and contribute to its development^[9].

By exposing students to different ideological and political perspectives, curriculum ideological and political education can help them develop critical thinking skills, empathy, and a sense of civic responsibility. This, in turn, can enhance their ability to analyze complex social issues, communicate effectively, and collaborate with others to find solutions.

However, it is important to note that the effectiveness of curriculum ideological and political education depends on the quality of the content, the pedagogical approach used, and the level of student engagement. Moreover, the implementation of such education must be guided by principles of academic freedom, respect for diversity, and democratic participation.

3.3. Course ideological and political help students strengthen teamwork spirit

Studying ideological and political courses can help students understand different perspectives and beliefs, which can lead to more open-mindedness and empathy towards others. This can contribute to better teamwork as students can learn to appreciate the strengths and weaknesses of their teammates and work collaboratively towards common goals.

Furthermore, ideological and political courses often involve discussions and debates, which can help students develop critical thinking and communication skills. These skills are essential for effective teamwork as they enable individuals to express their ideas clearly and listen to others' viewpoints, leading to more efficient problem-solving.

Overall, studying ideological and political courses can help students develop a more comprehensive understanding of society and human behavior, leading to improved teamwork skills and a more collaborative working environment.

3.4. Curriculum ideological and political education promotes the improvement of students' experimental innovation ability

Ideological and political education plays a crucial role in promoting the improvement of students' experimental innovation ability. This education helps students to develop a strong sense of social responsibility, enhance their creative thinking ability, and improve their experimental skills. Here are some ways in which ideological and political education promotes the improvement of students' experimental innovation ability:

- (1) Encourages critical thinking: Ideological and political education encourages students to think

critically about social and political issues. When students learn to analyze issues from different perspectives, they develop a deeper understanding of the world around them. This critical thinking ability is essential for experimental innovation, as it helps students to identify problems and come up with creative solutions.

(2)Fosters creativity: Ideological and political education also fosters creativity by encouraging students to think outside the box. By exposing students to different ideas and perspectives, this education helps them to develop their own unique approaches to problem-solving. This creativity is essential for experimental innovation, as it allows students to come up with new and innovative ideas.

(3) Develops teamwork skills: Ideological and political education promotes the development of teamwork skills. When students learn to work together effectively, they can accomplish more than they could individually. This teamwork is essential for experimental innovation, as it allows students to collaborate and build on each other's ideas.

(4) Enhances experimental skills: Ideological and political education also enhances students' experimental skills. By providing students with hands-on experience in problem-solving, this education helps them to develop their experimental skills. This hands-on experience is essential for experimental innovation, as it allows students to test and refine their ideas.

In conclusion, ideological and political education promotes the improvement of students' experimental innovation ability by encouraging critical thinking, fostering creativity, developing teamwork skills, and enhancing experimental skills. These skills are essential for students to become successful innovators and make a positive impact on society.

4. The application of curriculum politics in the Hall effect experiment

4.1 Ideological and political teaching based on experiment

First of all, this teaching mode can enable students to experience the methods of practical scientific research, enable students to deepen their understanding of the experimental results, and contribute to the development of reasoning thinking. Secondly, it can also greatly enhance students' practical ability and help them better understand the technical problems in the experiment process. In addition, the experiment can also stimulate students' creative thinking, so that students can put forward new experimental ideas according to the results, so as to better develop their ideological and political literacy. Therefore, the ideological and political teaching based on experiment is an effective way to improve students' practical ability and thinking ability.

Physical experiment plays an important role in the implementation of curriculum ideological and political education. It can not only help students understand the content of the class, but also improve their reasoning ability and practical skills. First of all, physical experiments make up for the practical defects of ideological and political theory courses. The experimental process is framed, which can intuitively show the logic in the process of social science practice, and further study the research methods of political science. Secondly, physics experiments can also enable students to acquire the application ability of relevant knowledge and lay a solid foundation for future social work. In addition, physics experiments can also stimulate students' enthusiasm, cultivate their self-confidence, help students form practical thinking, and better develop their ideological and political literacy. Therefore, to implement curriculum ideological and political education, physical experiments should be given full attention to provide effective practical teaching for students.

4.2 The application of curriculum thought and politics in the hall effect experiment

The Hall Effect experiment is a common experiment in physics that demonstrates the relationship between an electric current and a magnetic field. It involves passing a current through a

thin sheet of metal placed in a magnetic field perpendicular to the direction of the current. The resulting force on the electrons in the metal causes a voltage to be developed perpendicular to both the current and the magnetic field, known as the Hall voltage. The Hall Effect is widely used in various fields, including materials science, semiconductor physics, and electronics.

In the context of ideological and political education, the Hall Effect experiment can be used to demonstrate the importance of scientific research and technology in modern society. The experiment highlights the role of physics in the development of modern technology and its impact on various aspects of society, including medicine, transportation, and communication.

Moreover, the Hall Effect experiment can also be used to promote the values of cooperation and teamwork. In conducting the experiment, students must work together to set up the apparatus, observe the results, and analyze the data. This collaborative approach encourages students to learn from and support each other, fostering a sense of teamwork and mutual respect.

With the in-depth analysis of natural science and sociology knowledge, the ideological and political content of the course can be introduced into the Hall effect experiment. The experiment can help students to establish correct judgment and decision-making ability, thus promoting the development of curriculum ideology and politics in experimental teaching. In the experiment, students can complete the specific direction of action by studying the results of Hall effect and relevant theories, and simulating the actual situation. In addition, they can also combine with practice to analyze the experimental results by inductive methods to help them make correct choices. Through the Hall effect experiment, students can expand their thinking and help them better understand the important knowledge and concepts in the ideological and political curriculum. Therefore, curriculum ideological and political education can greatly promote students' learning and mastering of the Hall effect experiment.

Hall effect experiment can guide students to develop scientific thinking. During the experiment, students can check whether their analysis results of a situation are correct through the experimental results. In addition, students can also combine their own feelings and thinking results, and compare them with the experimental results or the environment at that time, which will help cultivate students to develop scientific methods based on evidence. In the experiment, students can also adjust their thinking path on the spot, thereby expanding their thinking, so that they can better understand the content of the ideological and political curriculum, and better grasp the current major social phenomena and essential laws. Therefore, curriculum ideological and political education can help students develop scientific thinking and promote the development of Hall effect experiment and related courses.

In conclusion, ideological and political education is an essential component of modern education, and its application in the Hall Effect experiment can help students develop a deeper understanding of the role of physics in modern society and promote values of teamwork and cooperation. By incorporating ideological and political education into scientific experiments, educators can help students become better-informed citizens who are equipped to make positive contributions to their communities and society as a whole.

5. Conclusion

Ideological and political education is an essential part of college physics experiments, and it plays a crucial role in shaping students' worldview, values, and attitudes towards science and society. One example of the application of ideological and political education in college physics experiments is the Hall effect.

The Hall effect is a well-known phenomenon in physics, which refers to the generation of an electric field perpendicular to both the current and the magnetic field in a conductor. This effect has many practical applications, such as in the measurement of magnetic fields and the detection of

electric currents.

However, the Hall effect also has significant ideological and political implications. For example, it can be used to explain the behavior of electrons in a magnetic field, which has important implications for the understanding of quantum mechanics and the nature of matter. Furthermore, the Hall effect can be used to study the properties of materials and their potential applications in various fields, such as electronics, medicine, and energy.

Therefore, in teaching the Hall effect, instructors can use it as an opportunity to discuss the role of science in society and the relationship between scientific knowledge and ideological and political values. They can also use it to encourage students to think critically about the ethical and social implications of scientific research and to develop a sense of social responsibility as future scientists and citizens.

Overall, the application of ideological and political education in college physics experiments, such as the Hall effect, can help students to develop a broader and more nuanced understanding of science and its relationship to society and culture.

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