Analysis of the Historical Innovation Practice of Physics Based on Big Data Analysis in the New Era

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Abstract. The history of physics is a discipline that studies the development of physics. Through big data analysis combining it organically with teaching materials will enable students to understand physics more deeply in the perspective of material development and enhance students' interest in physics learning. Exercise students' physical thinking, use scientific methods to deal with problems, and so on, so that they will benefit for life.

Keywords: History of physics, Teaching, Innovation, Big Data

1. Introduction
The history of physics is a study of how physics develops history. It is a natural science that develops along with the process of human understanding of the laws of nature. He aggregates the wisdom of human beings in social activities and integrates natural science and philosophy. And knowledge of the social sciences. In the middle school physical teaching process, the education of physics history is integrated, and the whole process of discovery, observation, thinking, experiment and creation of scientific explorers is presented to the students, so that students have a sense of immersiveness and thus understand scientific inquiry. It is not easy for them to appreciate their spirit of exploration for the truth, so as to continuously enhance the driving force of learning and improve the overall quality of students.

2. The necessity and feasibility of applying physics history to teaching
The history of physics is an important part of human cultural heritage. Physics has a strong inheritance. The scientific research methods in physics are mostly in the historical process of physics development. Therefore, it is necessary to understand the whole history of the natural world in the process of physics teaching in the middle school. The background and regular development process is presented to students, clarifying the important laws and formulas of the development and development of laws such as Newton's three laws and the law of universal gravitation in physics; the important scientific research methods and the evolution of the scientific viewpoints, as well as major sciences.
Breakthroughs have a tremendous impact on human understanding and social development, with a view to better educating students about historical values and values\textsuperscript{[1]}.

Psychological research has shown that a person's interest as a non-intellectual factor has a huge impact on learning, and it can provide researchers with inexhaustible motivation and inspiration. Most scientists' research and exploration of truth stories have certain interesting tastes, and their quality is very infectious. Compared with simple formula derivation and theorem proving, it is more likely to attract students' attention and interest.

3. Applying the history of physics to the teaching process

3.1. Applying the history of physics to the correct moral education for students

China is one of the four ancient civilizations. The four inventions have a world-famous reputation. After the founding of the People's Republic of China, the two countries have made great efforts to save the country, and countless benevolent people have returned to China to display their own great revenge. They are willing to be unsung heroes for the country's scientific and technological undertakings, and do not seek returns. China's two bombs, the peaceful development of nuclear energy, the rapid development of electronic technology, satellites, rockets, and missile technology have surpassed the world's advanced level. A number of unsung heroes have emerged in the physics community. Their deeds have inspired us. Their results benefit future generations. The history of the development of physics is a history of struggles full of science and superstition, truth and paradox, reform and conservatism. Introducing a large amount of historical materials in the history of physics, it can encourage students to learn their morale, spur students to be brave and forge ahead, and fight for the truth in the pursuit of truth. It can also educate students to establish the spirit of rejuvenating China and dedicating themselves to science\textsuperscript{[3]}.

The history of physics records the mystery of human beings and the exciting exploration process. If the teacher can grasp the psychology of the students and intersperse some materials of physics history, they will surely get good results. For example, when talking about the law of universal gravitation, let students know that not only Newton, but also Galileo, Kepler, Descartes, Hook, Halley and other scientists in the development of the law of universal gravitation, introduce their respective views, and The hard work of the work was finally proved by Newton's extraordinary mathematical ability. The review of the history of physics allows students to eliminate the mystery of existing physics knowledge, close the distance between scientists and students, understand the great side of scientists, and recognize their human side, so that students can explore knowledge. Enhance confidence in overcoming difficulties. Through the introduction of the history of physics, students recognize the twists and turns of scientific development, and of course many scientists have dedicated themselves to the truth. For example, Galileo was sentenced to life imprisonment for propagating Copernicus's heliocentric theory; Lichman died for lightning; Faraday abandoned the glory and wealth, and refused to be ruined by the "French civilians" several times. These scientists are not afraid of danger, and they spare no effort. Not admiring Lilu, not afraid of authority, pursuing the noble quality of truth, is conducive to cultivating students' scientific attitude of seeking truth from facts, and dedicating themselves to the spirit of scientific exploration. When students learn more about this, they will naturally be infected with their lofty qualities. They worship science and worship science, which inspires them to turn the worship of scientists into the motivation of hard study and cultivate students'
positive academic emotions[3]. Physical research methods are as follows.

3.2. Using the history of physics to stimulate students' interest in learning and improve teaching effectiveness

The history of physics records the historical facts of human beings going forward and uncovering the mystery of nature. There are many exciting stories. For example, the ancient Greek physicist Archimedes discovered Archimedes' law through the displacement of the crown and solved the calculation of buoyancy. Newton began to analyze the phenomenon from the apple landing on his head and proposed The famous law of universal gravitation; Galileo used the Leaning Tower of Pisa to confirm the fact that light and heavy objects fall as fast. But in the actual textbooks, many of these are invisible, and appear in front of the students: Ohm, Hook is just a law, Bernoulli is just an equation, Aphrodite is just a constant, if the teacher is only conceptually Teaching physics, then physics will become a boring subject. We should introduce the physics history behind these celebrities in the actual education and teaching process, so that their stories will shine in education and teaching. Good to stimulate students' interest and improve teaching results[4].

3.3. Using physical history to educate students about physical methods

In the history of the development of physics, scientists often have correct and scientifically ingenious physics research methods while creating deep knowledge of physics. For example, the concept of Faraday's "field", the classical mechanics system based on Newton's three laws, Einstein's theory of relativity, Ampere's molecular current hypothesis, Galileo's ideal experimental exploration method, etc., all show the extraordinary imagination of scientists. And unique scientific research methods. The proportion of physics history teaching is as follows.
Physical research methods education is both invisible and explicit. "Recessive education" means that in the process of teaching, the guiding role of scientific methods is implicitly played, the nouns of physical science methods are not present, and the methods are not explained, so that students learn the research methods in a subtle way. "Explicit education" is the name of the physical scientific research method in the teaching process. It is generally based on the existing knowledge level of the students, explaining the content and operation process of these methods, and guiding students to practice using these methods. While imparting knowledge of teaching materials, analyzing the history of physics development not only helps students understand the ins and outs of concepts, theorems, laws, and the development of scientific knowledge, but also helps students understand and grasp according to existing forms and systems. Knowledge, and thus gradually master the correct method of scientific thinking. For example, in an experiment, Roentgen accidentally discovered that the black paper-coated negative film was exposed, and found that the x-ray won the Nobel Prize. In fact, before this, in 1800, Gortzdam, Krox in 1887, had found such a similar phenomenon, but they did not pay attention to it. When Rutherford observed the particle beam penetrating the gold foil experiment, one thousandth of the particles changed the original direction of movement when passing through the gold foil, and a significant deflection occurred. This small phenomenon caught his attention. His ability to observe and analyze led him to discover the nuclear structure. In the process of understanding these knowledge, students can realize that paying attention to observation and earnestly conducting experiments is the key to learning physics. Therefore, in the future study, it is necessary to have a purposeful observation, hands-on experiment, and gradually cultivate diligent observation and diligent thinking. habit.

3.4. Using the history of physics to explore students' spiritual education

In the process of physics knowledge exploration, many physicists struggle with difficulties with the unimaginable perseverance and confidence of ordinary people, fight traditional ideas, fight against resistance and even persecution inside and outside the scientific community, pursue truth, and dare to innovate. For example: Bruno and Copernicus defended the "Heart of Heart" with life; Mrs. Curie practiced himself, and in order to study the radioactive element "Radium", he personally experimented. His diary is said to have strong radiation and has done thousands of things. In the second experiment, in the face of failure, I am not discouraged. Failure, re-entry, and ultimately made a major contribution to the cause of science, these devotional dedication will bring great inspiration to students.
Science is not a false one. It must be realistic and indomitable. The attitude of scholars towards science will undoubtedly have a profound impact on the students' thinking. In this study, students can cultivate the outstanding quality of seriousness and seeking truth from facts, and continue to climb the peak of science for the truth.

4. Summary
The history of physics has the distinctive characteristics of "physical science content, historical scientific methods". Through big data analysis, We have added physics history education in physics teaching, which not only cultivates students' strong interest in science, but also deeply understands the source of physics knowledge. Recognize, enlighten students' physical thinking, broaden students' physical vision, solve problems in students' knowledge cognition, and enhance students' awareness of physical research methods. With the in-depth development of physics history teaching, the educational function of physics history in practical teaching will eventually be recognized by more and more physics teachers!

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