Advances in Social Science, Education and Humanities Research, volume 412
International Conference on Modern Educational Technology and Innovation and Entrepreneurship (ICMETIE 2020)

Talking About Mechanics History Education in Mechanics Course

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Keywords: education of the mechanics history, humanities, scientific spirit, learning algorithm, probabilistic automata

ABSTRACT For some engineering disciplines such as materials science, civil engineering, mechanical engineering, mechanics-related disciplines are an important professional foundation course. The study of mechanics is related to the study of many subsequent professional courses. In addition, it is also related to the cultivation of theoretical learning ability and scientific quality. Therefore, the study of such courses is very important for these engineering students. The development of mechanics involves the solution of many engineering problems in history, which has promoted the continuous enrichment and development of mechanics. When the mechanics teacher of the university teaches students the knowledge of mechanics, the education of the contents of the history of mechanics development will play an important role in improving the students' comprehensive humanistic literacy. Education on the history of mechanics for college students can make the dull knowledge of mechanics more relevant to the reality of life and enable college students to draw nutrition from the history of human civilization. In addition, the history of mechanics can expand the student's knowledge system in many ways, and it can also shape the rigorous scientific spirit of students.

1. INTRODUCTION

We know that most engineering majors such as materials science, civil engineering, and mechanical engineering have a basic course in mechanics. For this course, the vast majority of teachers reported that it was difficult to teach, and the vast majority of students also reported that it was difficult to learn. Most college-related majors have higher rates of such courses [1]. How to make students interested in this course and learn this basic course carefully? This requires teachers of mechanics to seek a set of teaching methods suitable for contemporary college students.

The famous Chinese chemist Fu Ying (1902-1979) said: "The history of a science is the most precious part of that science, because science can only give us knowledge, but history can give us wisdom [2]." Mechanics The nature of the discipline, like the nature of science, lies in innovation and application. The history of the innovation and application of mechanics is unique and is a good material for scientific quality education. Carrying out the history of mechanics in the course of mechanics will have an important impact on the formation of critical thinking and perfect personality of college students. Next, this article will elaborate on the necessity of carrying out the history of mechanics in mechanics courses from many aspects.

2. CLARIFY RESEARCH TASKS OF MECHANICS THROUGH MECHANICS HISTORY EDUCATION

First of all, the history of mechanics education can make college students understand the history of the development of mechanics, and then have a clearer understanding of the connotation and extension of mechanics, and the research tasks of mechanics. There are reasons for this

misinterpretation in physics textbooks. The engineering mechanics we study and learn are just part of the classic mechanics of physics. But mechanics plays an important role in physics. The establishment of physics began with the study of mechanics. After the theory of relativity and quantum mechanics were proposed, the discipline of mechanics was gradually separated from physics under the impetus of engineering technology. Modern physics studies the material world of microstructures, while mechanics mainly studies the phenomena and laws of the macro material world. The history of physics is a basic science in the natural sciences, while mechanics focuses on solving practical engineering problems. Mechanics is both a basic science and an applied science. The development of mechanics has promoted the progress of modern industry.

To fully understand the relationship between physics and mechanics, and then to clarify the research tasks of mechanics, is the premise of studying mechanics.

3. Stimulate Interest in Mechanics Through Mechanics History Education

To learn mechanics well, students must first be interested in the subject of mechanics. The premise of interest is curiosity and curiosity about mechanics. So, curiosity is the driving force behind the exploration of science.

Mechanics originated from human's perception of the gravity of objects in nature. With the advent and improvement of production tools, various mechanical devices have gradually been produced. By observing and applying the mechanical laws of objects, people continuously summarize and deepen their understanding. To study mechanics, we must understand the development process of mechanics, understand the history of mechanics, and master the laws of the emergence and development of mechanics. Only in this way can we master the discipline of mechanics more deeply, and human beings can continue to promote the development and application of mechanics.

The current achievements in mechanics stem from the tireless exploration of generations of mechanics, during which there are many stories about exploration. Therefore, education in the history of mechanics never lacks teaching materials. Teachers of mechanics classes can introduce the biographical information of historical mechanical scientists and stories of mechanical knowledge exploration, and introduce mechanics-related concepts and related research processes. This also helps students to train scientific research methods, and thus to students. Carry out comprehensive quality training. Historically, celebrities such as Galileo and Da Vinci have made outstanding contributions to the development of mechanics. In addition, there are a series of formulas and theorems named by mechanics, such as Hooke's law and Euler's formula for the stability of the bar. Using these contents to expand can greatly enrich the classroom teaching content.

Through the education of the history of mechanics, students' knowledge can be systematized, and at the same time, it can be related to the development of productive forces, so as to better understand the status and role of mechanics science in promoting social and economic development. This learned knowledge is not single, but a rich and complete knowledge system of mechanics disciplines [3].

In addition to the learning of intellectual content, the history of mechanics can also give students ideological inspiration. The introduction of the struggle of outstanding scientists in the exploration of mechanics knowledge can not only stimulate students' interest in the study of mechanics, but also improve their initiative in learning.

4. Help Students Build Critical Thinking Through Mechanics History Education

Scientific exploration requires critical thinking, as does the exploration of mechanical knowledge. Many theorems of mechanics in history are constantly revised in the process of constant criticism,

negation and improvement. The law of mechanics is the induction, summary and deduction of a certain phenomenon by human beings in a certain period. With the development of history, social progress, and breakthroughs in other research methods, the laws of mechanics must have new understanding and results. Therefore, the exploration of mechanics requires a spirit of doubt and cannot be suppressed by the authority of the great men in front.

This requires students to be good at thinking and thinking in the process of studying mechanics. Teachers of mechanics can encourage and encourage college students to dare to doubt and challenge through the continuous improvement of some mechanical phenomena. The solution of many technical problems in engineering requires new theories and solutions. Therefore, neither the study of mechanics nor the application of mechanics in engineering can be constrained by stereotypes. We must dare to innovate and accept new things.

5. Cultivate Students' Engineering Awareness Through Mechanics History Education

The study of natural sciences originated from the study of mechanics for a certain reason. This is because the solution of many practical problems in life requires the solution of mechanical problems. As early as the ancient Greek period, people were studying the phenomenon of movement. Mechanics became a separate discipline from physics in the mid-nineteenth century. With the development and progress of economy and society, more engineering and technical issues need the guidance of mechanics theory. A large number of engineering and technical problems require the participation of mechanics, which has also promoted the development and progress of mechanics. This is also the case today. The solution of a large number of engineering and technical issues related to the national economy and the people's livelihood is inseparable from the innovation and progress of mechanics.

At the beginning of the development of fluid mechanics, there was a problem that it was either abstract and cumbersome and impractical, or relied too much on summaries of empirical formulas in pursuit of practicality. To solve this confusing problem, someone proposed the boundary layer theory. The proposition of this theory enriches and perfects the theory of fluid mechanics and makes the practicality of the theory of fluid mechanics improved. This is the birth of modern theory of fluid mechanics. The sinking of the Titanic and the explosion of the Space Shuttle Challenger made people analyze and investigate the cause of the accident, and promoted the development and improvement of fracture mechanics and elastic mechanics. The collapse of the Quebec Bridge made people realize the necessity of theoretical research on the stability of the strut. With the development and progress of society, there are more and more practical engineering problems that require us to continuously explore the field of mechanical theory research. New mechanical theories in turn can better guide engineering practice.

The development of the mechanics discipline has promoted the advancement of industrial technology, and the advancement of industrial technology will in turn cause the emergence of new engineering and technical problems. Therefore, the discipline of mechanics will be applied and developed in various technical fields without end. The history of the development of mechanics has witnessed this law. After all, the development of mechanics is to solve engineering and technical problems. Therefore, in the course of teaching, teachers of mechanics courses should focus on cultivating students 'engineering consciousness and cultivate students' innovative consciousness in the process of engineering and technical problem solving.

6. Improve Students' Mechanics Literacy Through Mechanics History Education

Due to the need for curriculum reform, the mechanics curriculum in many schools has been severely compressed. At present, most of the teaching of mechanics only teaches the content of the examination. As a result, both teachers and students are struggling with exams. In this way,

students' mechanical literacy cannot be improved very well. This has also weakened the support of mechanics teaching for engineering training goals.

However, the study of mechanics should not only be the study and mastery of related concepts and related theorems, but also to cultivate students' ability to analyze and solve problems using mechanical thinking. This ability is mechanical literacy. Mechanical literacy is very important for the training of engineering students, and it is related to students' ability to solve practical problems in future scientific research or work.

Through the history of mechanics education, we can cultivate students' mechanical literacy from the perspective of mechanics development.

7. Enhance Students' Humanities Mechanics History Education

The cultivation of humanities is the core content of modern education. Science and humanities are two major areas of the human spiritual world, embodying the two pursuits of human values. In personality cultivation, we call it scientific literacy and humanistic literacy. The two qualities are both different and related. The cultivation of humanistic literacy must not lack the cultivation of scientific literacy. The improvement of scientific literacy requires the support of humanities.

Mechanics is the most important and widely used natural science in the natural sciences. The development of the discipline of mechanics has promoted the development of productive forces, promoted the change of production methods, changed the way of life of people, and greatly enriched human thought and ideas. The history of the development of mechanics not only presents the essence and connotation of the scientific spirit, but also contains a rich humanistic spirit. The development history of mechanics shows the unity of scientific spirit and humanistic spirit.

The skilled artisans in ancient China had a deep understanding of mechanics. However, in ancient China, the mechanical sciences appeared in a combination of engineering technology, production and application, and no logical analysis or reasoning was made. Modern theoretical and systematic knowledge of mechanics was introduced from the West. Teachers of mechanics must make students understand this profoundly. They must be able to take pride in being the heirs of the Chinese civilization and study with concentration [4].

Colleges and universities are an important position for the country to cultivate high-quality talents. Only by integrating the education of scientific spirit and humanistic spirit can we better promote the development and progress of society. Therefore, the history of mechanics should be taught in the mechanics class to improve students' humanistic quality.

8. Conclusion

At present, more and more universities realize the importance of humanistic education for science and engineering students. It is necessary to strengthen mechanics education in mechanics courses. The education of the history of mechanics has a very good role in promoting students to deeply understand the nature of the knowledge related to mechanics, improve the establishment of knowledge structure, improve humanistic literacy and cultivate critical spirit. Education in the history of mechanics can not only enrich the content of the classroom, stimulate students 'interest in learning, but also play a positive role in enhancing students' morality and quality, training engineering awareness and innovative ability.

In the course of teaching, the mechanics teachers of colleges and universities can combine the knowledge system characteristics of mechanics curriculum with the data of mechanics history to modularize and integrate the knowledge points of mechanics curriculum. In teaching practice, the integration of knowledge in the history of mechanics has played a role in improving students' enthusiasm for studying mechanics courses and their awareness of practical innovation. In the teaching process, we must also pay attention to whether the content of the history of mechanics is

properly selected, and at the same time, we must pay attention to the teaching methods and techniques to achieve the best effect of the history of mechanics teaching.

Acknowledgment

This paper has been supported with the scientific research item found from Yunnan Provincial Department of Education (2020J0515) and the science & technology plan item found from Yunnan Provincial Department of Science & Technology-university joint fund surface item (2018FH001-048).

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