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Exploration and Practice of Integrating Labor Values Education into Higher Mathematics

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Abstract

Education on labor values has a rich connotation, which can help students establish correct labor concepts and understand the important value of labor for their own growth and social development. However, in the process of teaching higher mathematics, teachers mostly focus on imparting knowledge and training problem-solving skills, without fully exploring the educational elements of labor values contained in higher mathematics. Based on this, this article focuses on exploring the significance of integrating higher mathematics with labor values education, and proposes some specific teaching practice strategies.

Keywords

Advanced Mathematics; Labor values; Educational Strategy.

Labor values education plays a crucial role in shaping students' correct worldview, outlook on life, and values. The relationship between higher mathematics teaching and labor values education is not just a simple and rigid "patchwork", there is an inherent and inevitable connection between the two. Integrating the education of labor values into the teaching process of higher mathematics can enrich and diversify the connotation of higher mathematics teaching, and provide strong support for cultivating innovative talents with both morality and talent.

1. The Significance Analysis of the Integration of Higher Mathematics and Labor Values Education

1.1. Mathematics is a tool for discovering, analyzing, and solving problems

The mathematical knowledge system is extremely rich, and corresponding examples of concepts, formulas, and principles can be found in real life. In daily learning and life scenarios, mathematics plays an important role as a powerful tool for us to discover, analyze, and solve problems. When students apply mathematical knowledge to solve practical problems, they need to delve into the internal logical relationships of the problems and uncover the mathematical correlations hidden within them.

1.2. Mathematical thinking provides methodological guidance for labor creation

Labor mainly covers two important categories: mental labor and physical labor. In the context of education and teaching, when students interact with actual means of production such as

land and equipment, it is undoubtedly an excellent opportunity for them to deepen their understanding of mathematical knowledge. By immersing themselves in such interactive activities, students can truly appreciate the value of labor creation. This sense of value is not an unattainable, abstract or hollow concept, but something that students can truly experience through hands-on practice[1].

2. Strategies for Integrating Labor Values Education into Higher Mathematics Practice

2.1. Combining case teaching with labor scenarios

The key to carrying out labor values education in higher mathematics courses is to cleverly integrate abstract theoretical knowledge with practical production needs, design mathematical cases with labor scenario characteristics, and promote students to form correct value cognition.

For example, in the design of suspension bridge main cables in civil engineering, teachers guide students to use knowledge of derivatives and integrals to solve material optimization problems in the actual construction process, requiring the main cable curve to minimize the use of steel as much as possible while meeting the bearing capacity. This requires constructing a mathematical model of the main cable curve and calculating the optimal solution. In the specific teaching process, teachers can use the catenary equation as a starting point to guide students to establish differential equations (y=a \ cosh (x/a)) based on parameters such as bridge span and tower height. By integral calculation, the total length of the main cable (L=2a \ sinh (l/2a)) is derived, where (l) refers to the bridge span [2]. In this process, students not only need to comprehensively apply knowledge such as hyperbolic function differentiation and curve integration, but also need to fully consider the constraints of steel tensile strength and safety factor on parameter (a).

In order to deepen the connotation of labor education, teachers can supplement some on-site work scenarios of bridge builders in the teaching process. For example, how construction personnel accurately determine the anchor position in complex terrain, and how technicians use stress monitoring to ensure the safety factor of the main cable. Incorporating these labor details can help students understand that every parameter in the mathematical model corresponds to the technical points in real labor scenarios. This teaching method not only enhances students' ability to apply derivative integration knowledge, but also cultivates their values of respecting labor achievements and valuing practical testing[3].

2.2. Combining project-based learning to strengthen the concept of collaborative labor

In the field of education, there are various ways to strengthen students' collaborative labor concept. Design team collaboration projects can enable students to tackle complex tasks through division of labor and collaboration, thereby deeply cultivating their sense of teamwork and naturally integrating the concept of "labor creates value" into them.

Teachers can use the knowledge of solving extreme values of multivariate functions to carry out group practice projects and design research topics such as "Optimization of Urban Shared Bike Scheduling". Divide the students in the class into several research groups, each responsible for dynamic balance analysis of shared bicycle parking points in a certain area.

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The student team needs to collect bicycle usage data from different stations during the morning rush hour, establish a partial derivative relationship model between cycling demand and station capacity, and obtain the optimal scheduling plan by solving the conditional extremum. During this process, each group should hold regular roundtable discussions to engage in in-depth discussions on whether the model assumptions are reasonable and whether the data processing is standardized. If it is found that the cycling volume at a certain station suddenly decreases due to special circumstances such as road construction, the constraint conditions need to be readjusted, and all members need to discuss together whether the revised plan is feasible[4].

In teaching practice, teachers arrange periodic results reporting sessions to guide students to clearly recognize the value contribution of each labor process. For example, a certain group made a new discovery during the model optimization phase: when weather factors were introduced as additional variables, the positive definiteness of the Hessian matrix of the objective function changed, and they began to rethink the integrity of the original data. When students see the optimization plan completed by everyone working together being included in the reference suggestions of the local transportation management department, the concept of "labor creates value" naturally transforms into their intrinsic driving force for learning.

This teaching method is no longer limited to the traditional problem-solving training mode. It combines the rigor of mathematical knowledge with the practicality of labor education, forming a strong force for educating people and exploring a feasible path for cultivating new types of workers with scientific spirit and collaborative ability[5].

2.3. Integrating the History of Mathematics into Labor Spirit Education

In the process of explaining advanced mathematical knowledge, if teachers can naturally intersperse some stories of mathematicians' struggles, it will have unexpected effects. Students can truly understand the indispensable spirit of perseverance, innovation, and dedication in the process of scientific exploration from these cases. Furthermore, view mathematics learning as an intellectual labor, and understand the profound meaning of the phrase 'labor is of equal value, the key lies in creating value'.

In teaching practice, if teachers use the academic experience of mathematician Hua Luogeng as the starting point for teaching, they can well interpret the creative value contained in the special form of labor in mathematical research. Looking back to the Anti Japanese War period, the conditions at Southwest Associated University were extremely difficult. In the tin classroom, Hua Luogeng could only conduct research in the attic room transformed from an air raid shelter. The space there is cramped, and lighting can only rely on kerosene lamps. Even in such a harsh environment, during the intervals of Japanese air raids, Hua Luogeng remained focused on calculating the draft of the theory of pile prime numbers. This scene not only vividly depicts the difficult living conditions of intellectuals in the era of material scarcity, but also profoundly reveals the essence of scientific exploration - it is an intellectual labor that requires constant investment of energy.

Teachers can guide students to refer to photocopies of the original manuscript of "The Theory of Stacked Prime Numbers" and use a teaching method that concretizes abstract knowledge, allowing students to deeply understand that mathematical discoveries do not rely solely on fleeting inspiration, but rather rely on day after day, persistent logical deduction and formula

derivation. This is just like farmers farming, which requires continuous sowing, mathematicians also need to work hard in the field of thinking and make continuous efforts[6].

Conclusion

In summary, the organic integration of higher mathematics and labor values education is a profound change in educational philosophy, and it is also a positive attempt to develop talent training models in higher education. During actual teaching, delving into the hidden labor value behind mathematical knowledge can enable students to truly experience the struggle of mathematicians and appreciate their labor spirit. As students delve deeper into their studies, they will gradually realize that whether they are dedicated to scientific research work or dedicating themselves to ordinary labor positions in the future, every effort and dedication has significant value that cannot be underestimated.

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