

Exploration and Practice of the Implementation Path of "Fate Classroom" Based on Curriculum Ideological and Political Education—Taking the Course of Mechanical Principles as an Example

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Abstract: In recent years, ideological and political education in the curriculum has been integrated into various aspects and links of curriculum teaching. With the function of implicit ideological and political education, it has been combined with explicit ideological and political theory courses to construct a comprehensive curriculum education pattern. However, with the specific implementation and promotion of ideological and political education in some science and engineering courses, it has also been exposed that the exploration of ideological and political aspects is not thorough, the ideological and political elements are too broad, the classroom integration is not natural, and students' acceptance is low. It is necessary to further refine the ideological and political elements and explore the diverse integration paths of ideological and political education. Under the trend of ideological and political education reform in the curriculum, systematic research has been conducted on the design, implementation, and evaluation of ideological and political education in the mechanical principles curriculum, exploring new teaching models suitable for applied universities' mechanical principles curriculum. The pursuit of a new system of classroom teaching with ideological education but without ideological education, and with requirements but without requirements, has important value and significance, and has achieved good teaching reform results.

Keywords: Curriculum ideological and political education; Fate Classroom; Mechanical principles; Training mode

1. Introduction

Curriculum ideological and political education is the integration of ideological and political education into various links and aspects of curriculum teaching, with the function of implicit ideological and political education, and the construction of a comprehensive curriculum education pattern together with explicit ideological and political theory courses.

In recent years, as one of the main tasks of university work, curriculum ideological and political education has undergone rapid reform and development, and has received widespread attention from society. A series of policy documents, including the "Several Opinions on Deepening the Reform and Innovation of Ideological and Political Theory Courses in Schools in the New Era" issued by the State Council and the "Guiding Outline for the Construction of Ideological and Political Courses in Higher Education Institutions" issued by the Ministry of Education, have been successively issued, further strengthening the important significance of the implementation of ideological and political courses in talent cultivation strategies. However, with the specific implementation and promotion of ideological and political education in some science and engineering courses, it has also been exposed that the exploration of ideological and political aspects is not thorough, the ideological and political elements are too broad, the classroom integration is not natural, and students' acceptance is low. It is necessary to further refine the ideological and political elements and explore the diverse integration paths of ideological and political education.

With the country's strategic layout of becoming a "technological and manufacturing powerhouse", higher education institutions, as the cradle of talent cultivation, will inevitably bear more responsibilities. In the strategy of strengthening the country, mechanical talents must attach more importance to the

mission, foundation and innovation. As a basic course in the mechanical industry, mechanical principles need to be deeply reformed in the teaching link of the course, integrating ideological and political elements, professional basic theories and methods, and innovative thinking to make students want to learn, be able to learn, and repeat learning. Exploring the integration mechanism of ideological and political education in the course of mechanical principles, further empowering students with the glorious mission of industry revitalization, a scientific connotation of seeking truth and practicality, research and development skills in general machinery, and a professional literacy of daring innovation.

In summary, integrating the ideological and political path of the mechanical principles course into exploration and practice is of great value.

2. Research Status of Ideological and Political Reform in Higher Education Curriculum

Domestic and foreign scholars have made some achievements in exploring the integration path and mechanism of ideological and political courses, as well as in the classroom teaching mode and practice of mechanical principles courses.

Yuan Yuanyang et al. explored a method of integrating professional knowledge and ideological and political elements in the process of immunology teaching, but did not elaborate on the reliability verification of specific implementation^[1]. Hao Qinyi explored the path and effect of integrating ideological and political education into the curriculum in information technology teaching design, but the exploration of ideological and political education points in the curriculum is still not novel enough, and the integration effect is questionable^[2]. Gong Yiming explored the complete system of curriculum ideological and political reform in terms of knowledge and action, but did not involve specific curriculum application and feedback^[3]. Deng Zhizhi conducted research on integrating ideological and political education into engineering courses, but did not provide an explanation of the specific implementation methods in the classroom^[4]. Ke Zheng constructed the curriculum ideological and political system from four dimensions: objectives, content, implementation, and evaluation, but there was no specific explanation on the specific implementation methods and talent cultivation effects^[5]. Chen Huadong, Zhang Zirui, and others have achieved good results in comprehensive elaboration from theory to practice based on the concept of ideological and political education in the curriculum. However, when it comes to the top-level design of a certain course and its specific implementation and feedback, the case is not specific enough^[6-7].

In the pilot and reform of ideological and political education in the course of mechanical principles, Zhang Lei, He Lihong, and others successively conducted case studies from the perspective of moral education, explored the implementation path of ideological and political education in the course, and innovated in the classroom teaching mode. However, there was no effective feedback mechanism for the effectiveness of the ideological and political education pilot in the course^[8-9]. Guo Lihua, Li Shuwen, and others conducted modular research and practice on the design of ideological and political elements in the course of mechanical principles, but still did not address the abstract characteristics of the knowledge points in the course of mechanical principles, and did not specifically elaborate on the final evaluation of students' integration of ideological and political elements^[10-11]. Yin Yonghui et al. integrated various teaching methods into improving the teaching quality of mechanical principles courses, but did not systematically elaborate on the theoretical model of integrating ideological and political aspects^[12]. The National Association for Teaching and Research of Mechanical Principles has recently systematically elaborated and analyzed the teaching of mechanical principles. Based on the characteristics of the curriculum, comprehensive reforms have been carried out from connotation exploration to quality improvement, and big data analysis of teaching effectiveness has been utilized. This is a relatively comprehensive theoretical and practical research. However, the overly comprehensive curriculum reform and improvement strategy has overlooked the requirements for mastering different universities, student foundations, and knowledge points. The lack of emphasis on systematic ideological and political points will ultimately affect students' acceptance^[13].

3. The Necessity of Deepening the Reform of Ideological and Political Education in Higher Education Curriculum

In the education and teaching reform of ideological and political education in certain courses, the pursuit of comprehensiveness in ideological and political elements is too high, ignoring the acceptance level of different student foundations, and the implementation effect is only vague. In the research on the

integration of ideological and political education in the course of mechanical principles, most of the research is only for the purpose of ideological and political education, and teaching is for the purpose of teaching. In cases where students have difficulty understanding professional knowledge points, further strengthening the ideological and political education in the course often has the opposite effect, ultimately affecting the reform effect of ideological and political education in the course.

Under the trend of ideological and political education reform in the curriculum, it is of great significance to conduct systematic research on the design, implementation, and evaluation of ideological and political education in the mechanical principles curriculum. It is of great value not to pursue the perfect ideological and political quality of talents, not to emphasize the comprehensive understanding of abstraction knowledge points, and to explore new teaching models suitable for the mechanical principle course in applied universities in combination with the goal of training applied talents. It is also of great value to pursue the classroom teaching mechanism of the new system of mechanical principle course, which has ideology but not ideology, and has requirements but not requirements.

4. The Reform Measures of Ideological and Political Education in the Course of Mechanical Principles as a Case Study

4.1. Basic ideas

In the context of the teaching reform of ideological and political education based on the curriculum, combined with the characteristics of applied universities in the teaching of mechanical principles courses, this study explores a receptive and easily integrated ideological and political element. The teaching process of ideological and political elements such as love for work, seeking truth and practicality, and being brave in innovation is integrated into a "fate classroom", and based on this, the teaching goal of "consolidating the heart of ideological and political education, and doing our best to strengthen the country" is incubated, with the aim of ultimately establishing a replicable, easy to implement The theoretical model for the implementation of the fate classroom in the course of mechanical principles with multiple feedback is shown in Figure 1: based on the fate elements of industry and education, the craftsmanship of learning for a strong country through practice; Based on the elements of foundation and innovation, practice is the ability to learn for a strong country.

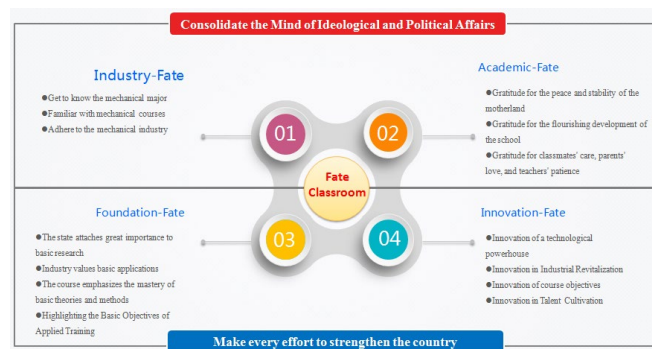


Figure 1: Mechanical Principles Course - Fate Classroom Theory Model

In the analysis of the specific implementation path of the course, based on the four elements of the fate classroom theory model, the practice is mainly carried out from three aspects: the knowledge system architecture of the course, the diversified teaching mode of the classroom, and the evaluation criteria for learning objectives, forming the implementation path system of the mechanical principle course fate classroom, as shown in Figure 2, specifically:

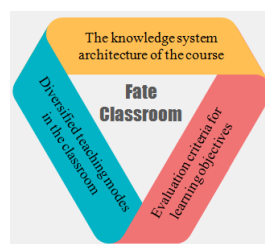


Figure 2: Mechanical Principles Course - Implementation Path System of Fate Classroom

4.2. Key measures

4.2.1. The knowledge system architecture of the course

Based on the teaching outline of the Mechanical Principles course, the entire course knowledge system is deconstructed from the theoretical connotation of the Fate Classroom. Different chapters correspond to different fate characteristics, with the aim of achieving multi-level implementation of the Fate Classroom through the integration of ideological and political elements in the new course teaching outline. The fate characteristics and objectives corresponding to specific chapters are shown in Table 1.

Table 1: Comparison Table of Knowledge System Architecture and Fate Characteristics of Mechanical Principles Course

Number	Teaching Content	Class Hours	Knowledge Elements	Fate Elements	Integration Method
1	Introduction Key points: The research object, content, nature, task, and role of this course. Difficulties: The research object and content of this course.	2	(1) Understand the strengths and weaknesses of the country in advanced manufacturing. (2) The importance and value of mastering the basic principles and methods of institutions.	(1) The fate of working in the mechanical industry. (2) Studying in university is a matter of fate. (3) The fate of consolidating professional foundation. (4) The fate of cultivating innovative thinking.	Clarify why, how, and how to learn in the course introduction, consolidate the foundation, strengthen understanding, promote innovation, and assist in building a strong country.
2	Structural Analysis of Institutions Key points: Definition and types of motion pairs; The method of drawing a motion diagram of a planar mechanism; The calculation of the degree of freedom of a planar mechanism, where the mechanism has conditions for determining motion; The basic principle of disassembling planar mechanisms. Difficulties: Drawing methods for kinematic diagrams of planar mechanisms and calculating degrees of freedom.	5	(1) Master the method of drawing a schematic diagram of the mechanism. (2) Master the calculation method of mechanism degrees of freedom.	(1) The fate of promoting the rejuvenation of the country through technology. (2) The fate of seeking truth through science and seeking knowledge through practicality. (3) Putting people first and possessing the fate of comprehensive development. (4) The fate of basic research in the industry.	Strengthen the natural attributes of machinery in scientific issues in theory, and dissect the core values of the surface to see the essence.
3	Kinematic Analysis of Mechanisms Key points: The method of analyzing the speed of a mechanism using the instantaneous center of velocity method; The vector equation graphical method is used to calculate the velocity and acceleration of the mechanisms; The analytical method is a general method for analyzing the motion of mechanisms. Difficulties: Instantaneous center method and vector equation graphical method for analyzing the velocity and acceleration of the mechanism.	5	(1) Master the general methods of mechanism motion analysis. (2) Master the concept of instant heart. (3) Master the graphical method of vector equations.	(1) Understanding the fate of the Earth's stable movement and the country's long-term development. (2) Feeling the fate of relative motion and relative stillness. (3) Gratitude for employment, gratitude for learning, and gratitude for pursuing dreams, and gratitude for the fate of seeing, thinking, and realizing. (4) The fate of basic research in the industry.	Understand the general methods of institutional analysis and develop the basic qualities of using basic analytical methods for general institutional analysis; Understand the importance of methods, the importance of general mechanism analysis, and the necessity of learning.
4	Force Analysis of Mechanisms Key points: The meaning and determination method of component inertia forces; Determination of friction forces in motion pairs; Structural force analysis without considering friction forces; A method for analyzing structural forces when considering frictional forces. Difficulties: Method for determining friction forces in motion pairs.	3	(1) Familiar with and master the sources and analysis methods of friction in motion pairs. (2) Master the analysis method of considering frictional forces and structural forces.	(1) The synergistic development of force and motion. (2) The fusion and shared fate between the surface and the inner. (3) The fate of scientific research literacy in the face of resistance and courage to move forward. (4) The fate of basic research in the industry.	Enhance the general mechanism analysis method and clarify the general and special concepts of mechanism force analysis.
5	Efficiency and self-locking of mechanisms Key points: calculation method of mechanical efficiency; The essence and conditions of mechanical self-locking. Difficulties: Calculation of mechanical series and parallel efficiency; Conditions for mechanical self-locking.	2	(1) Master the calculation method of mechanical efficiency. (2) Master the essence and conditions of mechanism self-locking.	(1) The fate of working in the mechanical industry. (2) The fate of promoting the rejuvenation of the country through technology. (3) The pursuit of efficiency and fairness. (4) Gratitude for employment, gratitude for learning, gratitude for pursuing dreams, and gratitude for the fate of seeing, thinking, and realizing. (5) The fate of basic research in the industry.	Enhance mechanical efficiency to promote industrial efficiency, boost the concept of sustainable development of rational efficiency, and clarify the complementary relationship between constraints and development in development.
6	Institutional balance Key points: Principles and methods of static balance for rigid rotors; The principle and method of dynamic balancing of rigid rotors. Difficulties: Calculation method for static and dynamic balance of rigid rotors.	2	(1) Understand the principles and methods of static balance for rigid rotors. (2) Master the principles and methods of dynamic balancing of rigid rotors.	(1) The fate of working in the mechanical industry. (2) The fate of promoting the rejuvenation of the country through technology. (3) Pursuing the fate of movement and balance. (4) Gratitude for employment, gratitude for learning, gratitude for pursuing dreams, and gratitude for the fate of seeing, thinking, and realizing. (5) The fate of basic research in the industry.	Enhance the awareness of the impact of institutional balance on mechanical balance, and clarify the development path from local to overall, and from quantitative to qualitative changes.
7	Analysis of planar linkage mechanism Key points: Types and applications of planar four bar mechanisms; Basic knowledge of planar four bar mechanisms; Graphic method for planar four bar mechanisms. Difficulties: characteristics of four-bar mechanism (basic knowledge of crank existence conditions, quick return movement, stroke speed ratio, pressure angle, transmission angle, etc).	6	(1) Understand the types and applications of planar four bar mechanisms. (2) Basic knowledge of planar four bar mechanisms. (3) Master the graphic method of planar four bar mechanisms.	(1) The fate of promoting the rejuvenation of the country through technology. (2) The fate of seeking truth through science and seeking knowledge through practicality. (3) Putting people first and possessing the fate of comprehensive development. (4) The relationship between key component research and overall research. (5) Gratitude for employment, gratitude for learning, gratitude for pursuing dreams, and gratitude for the fate of seeing, thinking, and realizing. (6) The fate of cultivating innovative thinking.	Strengthen the design and analysis significance of typical linkage mechanisms, understand the promoting role of typical mechanisms for the overall development of institutions and even the industry, and practice the strategy of strengthening the country.
8	Analysis of cam mechanism Key points: Application and classification of cam mechanisms; The motion law of the push rod; Design of cam contour curve; Determination of basic dimensions of cam mechanisms. Difficulties: Common motion laws and characteristics of driven components; Design of cam profiles.	4	(1) Understand the application and classification of cam mechanisms. (2) Master the movement pattern of the push rod. (3) Master the design method of cam contour curves. (4) Understand the determination of basic dimensions of cam mechanisms.	(1) The fate of promoting the rejuvenation of the country through technology. (2) The fate of seeking truth through science and seeking knowledge through practicality. (3) Putting people first and possessing the fate of comprehensive development. (4) The relationship between key components of the connecting rod and the research on the entire machine. (5) Gratitude for employment, gratitude for learning, gratitude for pursuing dreams, and gratitude for the fate of seeing, thinking, and realizing. (6) The fate of cultivating innovative thinking.	Strengthening the processing and manufacturing industry and plays an irreplaceable fundamental role in the foundation of advanced manufacturing.

9	<p>Gear mechanism analysis Key points: Basic laws of tooth profile meshing; Involute characteristics and meshing characteristics of involute tooth profiles; The names and dimensions of each part of involute standard gears; The principle of generating involute gears, the phenomenon of undercutting and the minimum number of teeth; The principle of gear modification correction and the type of modified gear transmission; Calculation of parameters for helical cylindrical gear transmission, bevel gear transmission, and worm gear transmission. Difficulties: meshing characteristics of involute tooth profiles, parameter calculation of various transmission gears, principle of gear modification correction, and backlash free meshing of modified gears.</p>	8	<p>(1) Master the basic laws of tooth profile meshing; involute characteristics and meshing characteristics of involute tooth profiles. (2) Master the names and dimensions of various parts of involute standard gears. (3) Master the principle of involute gear generation machining, the phenomenon of undercutting, and the minimum number of teeth. (4) Master the principle of gear modification correction and the type of modified gear transmission; Calculation of parameters for helical cylindrical gear transmission, bevel gear transmission, and worm gear transmission.</p>	<p>(1) The fate of promoting the rejuvenation of the country through technology. (2) The fate of seeking truth through science and seeking knowledge through practicality. (3) Putting people first and possessing the fate of comprehensive development. (4) The relationship between gear research of key components and overall machine research. (5) Gratitude for employment, gratitude for learning, gratitude for pursuing dreams, and gratitude for the fate of seeing, thinking, and realizing. (6) The fate of cultivating innovative thinking.</p>	<p>Strengthen the advantages of gear mechanisms in reliability, speed, efficiency, and other aspects, explore their unique symbolic role in machinery, and strategically position the role of gears.</p>
10	<p>Analysis of gear train mechanism Key points: classification of gear trains; Calculation of transmission ratio of fixed axle gear trains; Calculation of transmission ratios for epicyclic and hybrid gear trains; The function of the gear train; Introduction to special planetary gear trains. Difficulties: Calculation method for transmission ratio of gear trains.</p>	4	<p>(1) Understand the classification of gear trains. (2) Master the calculation of transmission ratio for fixed axle gear trains; Calculation of transmission ratios for epicyclic and hybrid gear trains. (3) Familiar with the functions of gear trains.</p>	<p>(1) The fate of promoting the rejuvenation of the country through technology. (2) The fate of seeking truth through science and seeking knowledge through practicality. (3) Putting people first and possessing the fate of comprehensive development. (4) The relationship between the wheel system and the overall transmission ratio in the study of key components. (5) Gratitude for employment, gratitude for learning, gratitude for pursuing dreams, and gratitude for the fate of seeing, thinking, and realizing. (6) The fate of cultivating innovative thinking.</p>	<p>Strengthen the role of the group and explore the connection between individuality and commonality.</p>
11	<p>Other commonly used institutions Key points: The working principle and main parameter calculation of the ratchet mechanism and groove wheel mechanism. Difficulties: Design of ratchet mechanism and groove wheel mechanism.</p>	2	<p>(1) Understand the working principles of ratchet mechanism and groove wheel mechanism. (2) Familiar with the main parameter calculation of ratchet mechanism and groove wheel mechanism.</p>	<p>(1) The fate of working in the mechanical industry. (2) The fate of consolidating professional foundation. (3) The relationship between research on non critical components and the development of the mechanical industry. (4) The fate of cultivating innovative thinking.</p>	<p>Understand the interaction between other auxiliary institutions and typical institutions, analyze the main and secondary contradictions, as well as the main and secondary aspects of the contradictions.</p>
12	<p>Design and Innovation of Mechanical Transmission System Scheme Key points: the motion design of execution components and the selection of prime movers; Selection, variation, and combination of mechanisms; Preparation of mechanical transmission system plan. Difficulties: Cultivate students' innovative ability.</p>	2	<p>(1) Understand the motion design of execution components and the selection of prime movers. (2) Master the selection, variation, and combination of mechanisms. (3) Familiar with the drafting of mechanical transmission system plans.</p>	<p>(1) The fate of working in the mechanical industry. (2) Studying in university is a matter of fate. (3) The fate of consolidating professional foundation. (4) The fate of cultivating innovative thinking.</p>	<p>Enhance the urgency of the times' development towards the demand for innovation, the thirst for innovative talents, and the dependence on institutional innovation.</p>

4.2.2. Diversified teaching modes in the classroom

By combining the established online MOOC courses, utilizing various teaching materials, project-driven, thematic analysis, and other teaching methods through a combination of online and offline, in and out of the classroom, and before and after the course, and effectively relying on the characteristics of industry education integration, a fate classroom teaching mode suitable for diversified mechanical principles courses in applied undergraduate colleges is established, as shown in Figure 3.

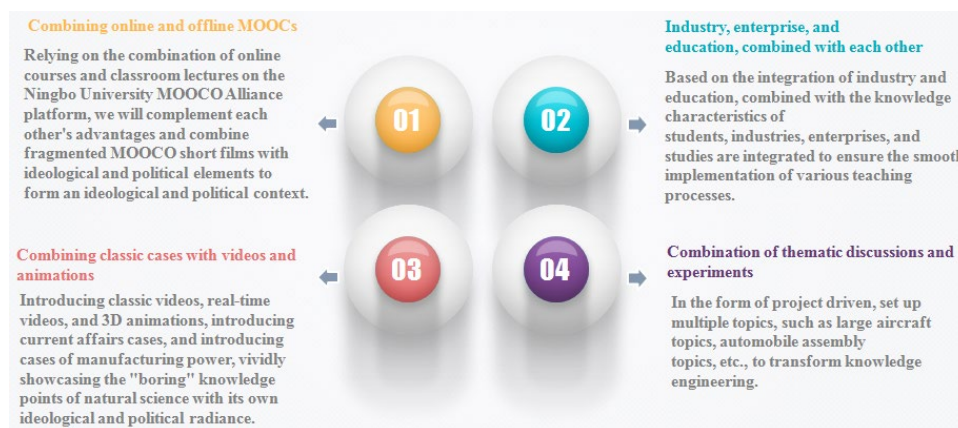


Figure 3: Mechanical Principles Course - Fate Classroom Diversified Teaching Mode

4.2.3. Evaluation criteria for learning objectives

Combining the characteristics of the mechanical principles course that emphasizes basic research and innovative thinking, combined with the classroom practice of fate elements, a three-dimensional evaluation standard is proposed for the convenience of output evaluation to reflect the fate goals of love, dedication, pragmatism, and excellence, to reflect the knowledge goals of the basic theories and methods of general mechanical design analysis, and to reflect the ability goals of innovative thinking, innovative techniques, and innovative achievements, The overall goal of practicing the ultimate "concentration effort" fate classroom is shown in Figure 4.

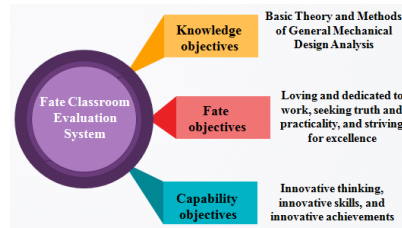


Figure 4: Mechanical Principles Course - Destiny Classroom 3D Evaluation System

5. The Effect of Ideological and Political Reform in the Course of Mechanical Principles as a Case Study

Over the past two years, a large amount of work has been carried out and a series of educational reform achievements have been achieved.

(1) In terms of educational research

The applicant and team members have frontline teachers with rich educational and teaching experience, as well as rich experience in corporate practice.

Li, both teachers and party members, and students are also active members of the Party. Teachers are familiar with the advantages and disadvantages of traditional mechanical principle courses, as well as the characteristics of students in applied undergraduate colleges. They can adjust and optimize the curriculum and teaching knowledge system based on the ideological and political elements of the curriculum, integrate various industrial development needs, and optimize teaching links. The team members also include students on campus, who can timely and effectively promote the establishment of optimization paths in the construction of the teaching system.

The applicant and team have applied for 6 provincial and municipal level teaching and research projects in innovative talent cultivation and innovative education reform through the "fate classroom" based curriculum ideological and political reform, published 4 teaching and research papers, and won multiple provincial and municipal level curriculum ideological and political team awards.

(2) In terms of educational practice

The applicant and team members, relying on the teaching and research team, have conducted multiple teaching seminars on course content and teaching methods.

Integrate and optimize the curriculum system in terms of methods, teaching methods, and assessment systems, while enhancing one's educational and teaching abilities. Meanwhile, in terms of educational innovation and practice, team members have completed four specialized training lectures.

(3) Integration of industry and education

The applicant and team members actively engage in various forms of cooperation between the school and the enterprise (open teaching mode), promoting our school and the combination of technological innovation and the development of high-tech industries by enterprises has formed a good model of "school teacher enterprise" close integration and collaborative development through product design and research and development. In terms of achievement transformation, we have also established long-term cooperation mechanisms and platforms with multiple companies, including Huaqin Intellectual Property Co., Ltd., Cixi Jimei Trademark Office, Baoding Guochi Patent Office, Sichuan Tsinghua Ruiguang Intelligent Technology Co., Ltd., and Changxing Changsheng Trading Co., Ltd. We have initially established cooperative relationships based on the innovation education reform platform in talent cultivation Extensive communication and cooperation have been carried out in various aspects such as practical teaching and achievement transformation.

6. Conclusions

Propose a theoretical model for the design, implementation, and evaluation of mechanical principles in applied undergraduate colleges, enrich theoretical research in higher education, and provide new ideas for the ideological and political reform of mechanical principles courses in the cultivation of applied talents in universities; Exploring a path for the reform of mechanical principles curriculum towards

knowledge goals, ability goals, and ideological and political goals, from the aspects of curriculum system, teaching mode, to evaluation feedback, to practice educational reform. Through practical feedback, the theoretical system is supplemented, ultimately promoting the integration and development of industry, learning, and research, further strengthening local service skills, and pursuing a strong practical country.

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References

- [1] Yuan Yuanyang, Nie Hong. *Reflection and Exploration on Integrating Ideological and Political Education into Undergraduate Immunology Teaching [J]*. *Chinese Journal of Immunology*, 2021, 37 (1): 98-100.
- [2] Hao Qinyi. *Research on Integrating Ideological and Political Education into High School Information Technology Teaching Design [D]*. Yan'an: Yan'an University, 2021.
- [3] Gong Yiming. *The Knowledge and Practice of Ideological and Political Education in Curriculum [J]*. *Chinese University Teaching*, 2021, 5:77-84.
- [4] Deng Zhizhi. *Time and Reflection on Integrating Ideological and Political Education into Engineering Professional Courses [J]*. *Science and Education Wen Hui*, 2022:84-87.
- [5] Ke Zheng. *Curriculum Ideological and Political Education and Its Implementation Framework from the Perspective of Curriculum Theory [J]*. *Higher Education in China*, August 37-40, 2021.
- [6] Chen Huadong. *Course Ideological and Political Education: From Theory to Practice [M]*. Shanghai: Shanghai Jiao Tong University Press, 2020.
- [7] Zhang Zirui, Wei Yanni. *Research on Curriculum Ideological and Political Practice [M]*. Beijing: China Agricultural Science and Technology Press, 2020.
- [8] Zhang Lei, Tang Bin, Yong Ling'e, etc. *Consolidate great wisdom through small stories and construct a new path for ideological and political education in the course of mechanical principles [J]*. *Science and Education Literature*, 2021, 5:57-60.
- [9] He Lihong, Liu Lan, Wang Xian'an, etc. *Construction of Ideological and Political Education in the Course of Mechanical Principles under the Background of New Engineering [J]*. *Science and Education Literature*, 2020, 6:81-82.
- [10] Guo Lihua, Bo Jie, Jiang Quansheng, etc. *Exploration and Teaching Implementation of Ideological and Political Education in Mechanical Professional Courses - Taking "Mechanical Principles" as an Example [J]*. *Science and Education Guide*, 2021, 7:104-106.
- [11] Li Shuwen. *Research on the Design and Teaching Integration of Ideological and Political Elements in the Course of "Mechanical Principles" [J]*. *Mechanical Science and Technology*, 2021, 50 (8): 86-88.
- [12] Yin Yonghui, Gao Zhi, Zhang Lanzhu. *Reflection and Practice on Improving the Teaching Quality of Mechanical Principles Course [J]*. *Chinese University Teaching*, 2014, 6:57-59.
- [13] National Association for Teaching and Research of Mechanical Principles. *The Connotation Development and Quality Improvement of Mechanical Principles Curriculum for New Engineering Subjects [M]*. Dalian: Dalian University of Technology Press, 2019.