

# Teaching Exploration and Research on Ideological and Political Education in Metalworking Practice Curriculum in Application-oriented Universities Under the Background of New Engineering Disciplines

Fu Hui<sup>1</sup>, Li Yinan<sup>1</sup>, Li Jun<sup>1</sup>, Huang Na<sup>1</sup> & Xi Wei<sup>1</sup>

<sup>1</sup> College of Artificial Intelligence, Beijing Union University, China

Correspondence: Fu Hui, College of Artificial Intelligence, Beijing Union University, Beijing, China. Tel: 0086-185-1827-7255. E-mail: jqrfuhuiatbuu.edu.cn

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## Abstract

With the continuous advancement of the construction of "New Engineering" and the deepening of the ideological and political concept of "Moral Cultivation", new requirements are put forward for the construction of talents in application-oriented colleges and universities. *Metalworking Practice*, as a basic course both practical and technical, is an indispensable practice link in application-oriented colleges and universities. Digging into the ideological and political elements and the organic combination of metalworking practice content, to build a comprehensive ideological and political system of *metalworking practice* curriculum, to provide reference for the ideological and political reform of metalworking practice in applied undergraduate colleges.

**Keywords:** Application-oriented Universities, curriculum ideological and political, metalworking practice

## 1. Introduction

At the National Conference on Ideological and Political Work in Higher Education Institutions, General Secretary pointed out: "We should integrate ideological and political work throughout the entire educational and teaching process to achieve all-round and all-process education." Under the background of New Engineering, the university vigorously promotes the construction of application-oriented universities and strives to cultivate "high-quality application-oriented innovative talents". The Curriculum of *Metalworking Practice* has established the teaching objectives of "enhancing practical ability, cultivating innovative spirit and improving comprehensive quality". The school has carried out the ideological and political construction of curriculum with the characteristics of "applying knowledge to practice" based on the background of building an application-oriented university and the standard of education engineering certification, combined with the professional characteristics and training levels of students in our school. *Metalworking Practice* must keep up with the pace of curriculum ideological and political reform, build an all-round curriculum ideological and political teaching system, and truly achieve "preaching, moral, and cultivating people".

## 2. The Necessity of Carrying out the Ideological and Political of Metalworking Practice Curriculum

### 2.1 Analysis of Ideological and Political Status of Metalworking Practice Curriculum

In recent years, with the continuous advancement of curriculum ideological and political teaching reform, various disciplines have achieved fruitful teaching results in ideological and political construction. However, curriculum ideology and politics in the teaching of engineering practice does not seem to attract enough attention, most universities are still in the exploration stage.

There are some problems in the curriculum of *Metalworking Practice*, such as the lack of ideological and political ideas in teaching means, teaching methods, teaching evaluation, the reform of curriculum ideological and political ideas floating on the surface, and the lack of effective penetration. *Metalworking Practice* has always followed the teacher's demonstration and the students' watch and copy, this "Spoon-feed" teaching mode, driven by the curriculum ideological and political reform, it is difficult to insert some ideological and political elements to achieve the purpose of curriculum ideological and political teaching. This kind of formal curriculum ideological and political education not only fails to achieve the goal of "Educating people by virtue", but makes students more confused. At present, the lack of ideological and political awareness in teaching, the insufficient understanding of

curriculum ideological and political, and the incomplete mining of ideological and political elements must be paid attention to. In addition, the existing assessment system should also integrate ideological and political elements into it, assess the ideological and political effects of the curriculum, check the educational effectiveness of the curriculum *Metalworking Practice*, so that the course system of *Metalworking practice* forms a closed loop.

## 2.2 Analysis of the Ideological and Political Situation of Metalworking Practice Course

*Metalworking Practice*, also known as *mechanical engineering training*, is a very practical basic curriculum. It is a required curriculum for engineering students to learn the knowledge of mechanical manufacturing technology, get familiar with the processing and production process, and cultivate the ability of practice and innovation. It is also an important content of labor education and practical education in colleges and universities in the new era. Combined with the ideological and political construction plan of professional curriculum and the practical teaching characteristics of *Metalworking practice*, the paper records, analyzes and summarizes the performance of students in the metalworking practice teaching process in the past five years. In combination with the orientation of our application-oriented undergraduate program, we analyze the students who have participated in metalworking practice in recent years from the four dimensions of basic knowledge, practical operation, achievement and ability improvement, as shown in Figure 1 below.

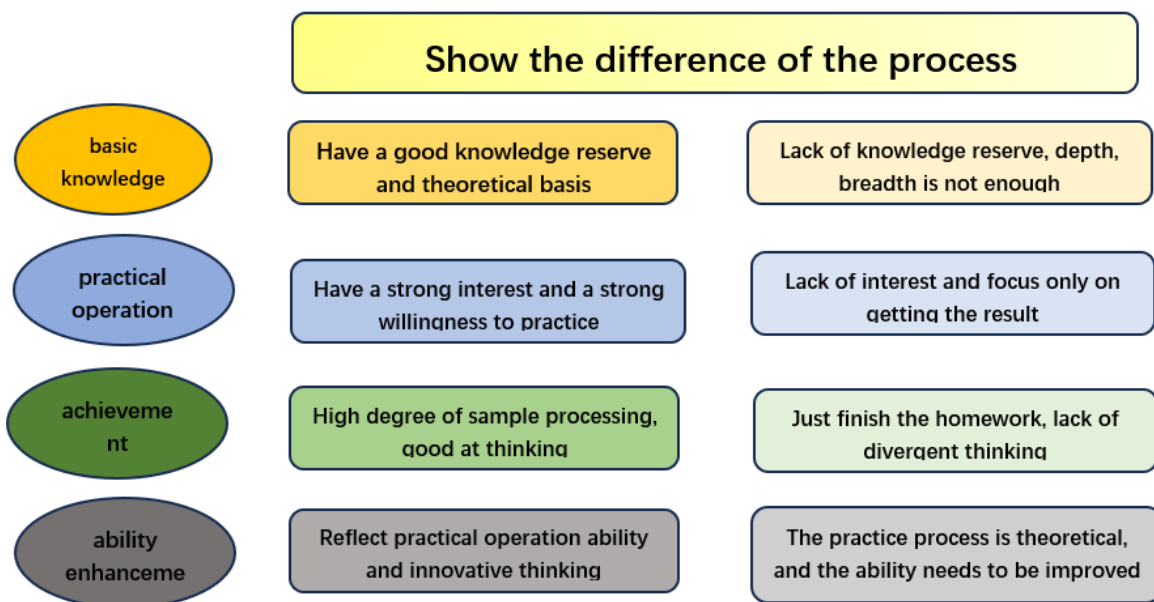


Figure 1. Analysis of learning situation of *Metalworking Practice* curriculum

## 3. Construction and Implementation of Ideological and Political System of Metalworking Practice Curriculum

### 3.1 Condensation Target of Ideological and Political System of Metalworking Practice Curriculum

We dig deep into the causes of these four pain points, centering on the ideological and political construction of the curriculum, will enhance students' "Excelsior", "Craftsman Spirit", "Green Engineering", "Innovative Spirit", "Cultural self-confidence", "Professional Quality", "Social Responsibility", "Patriotism" and other ideological and political elements as the starting point of the ideological and political construction of the *Metalworking Internship* curriculum, encourage students to achieve three unity:

Unity of knowledge and ability: master the basic machinery manufacturing methods and processes, to be realistic, diligent and fine;

Unity of process and method: Cultivate the ability to analyze and solve complex engineering problems, improve students' innovative spirit and comprehensive engineering literacy;

Unity of emotion and values: Cultivate students' feelings of home and country, craftsman spirit, professional quality, etc., guide students to establish correct values, so that they have a mind of longitude and latitude, knowledge and practice.

3.2 Metalworking Practice Course Ideological and Political Overall Construction Summary

Metalworking Practice is student-centered, implements the OBE education concept, and is oriented to cultivate students' innovative consciousness and spirit. Centering on the "three unified" overall teaching objectives of curriculum ideology and politics, the elements of curriculum ideology and politics are explored; The teaching design mode of "Hierarchical" and "Serial" is adopted, and ideological and political elements such as "Excelsior", "Innovative Spirit" and "Green Environmental Protection" are organically integrated into the practice process. Figure 2 is a summary of the overall ideological and political construction of Metalworking Practice curriculum.

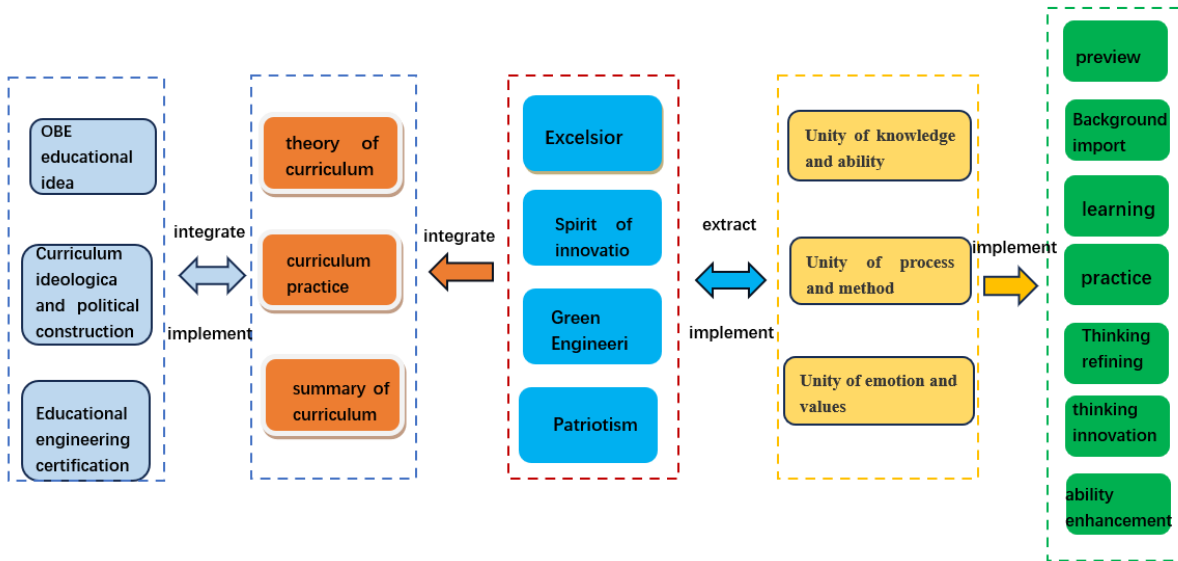


Figure 2. The summary of the overall ideological and political construction of *Metalworking Practice* curriculum

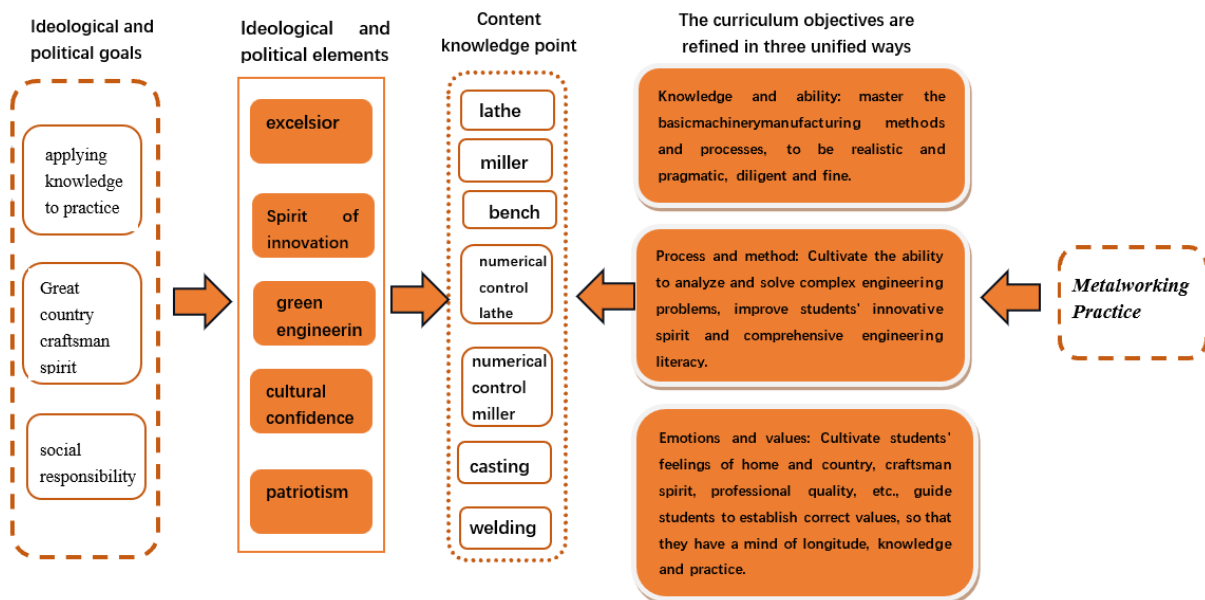


Figure 3. The overall ideological and political design drawing of *Metalworking Practice* curriculum

3.3 Organic Integration of Curriculum Ideological and Political Elements

Based on the analysis of students' learning situation and teaching pain points, the curriculum *Metalworking Practice* rearranges the knowledge points of the curriculum, explores the potential ideological and political elements in depth, and carries out the overall design of the course ideological and political, as shown in Figure 3.



and political elements of the curriculum of "Excelsior " and "Cultural Confidence", which is highly in line with the ideological and political goals of the curriculum of "Great Power Craftsman Spirit".

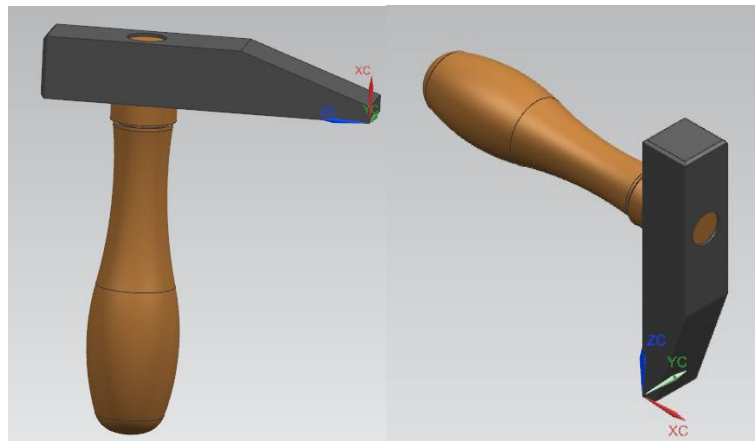


Figure 5. Results of Series Teaching of Lathe and Bench

#### 3.4.4 Improve Curriculum Assessment and Evaluation

Under the background of New Engineering, traditional assessment methods have been unable to examine a student's innovation ability, design ability and analysis ability. Now the ideological and political elements are integrated into the assessment standards, the curriculum objectives and ideological and political objectives are quantified and detailed, and through the establishment of a scientific, comprehensive and diversified assessment mechanism, practical ability and ideological and political achievements can be fully reflected in the assessment system. Teachers receive feedback, make adjustments and continue to make progress, so that the entire curriculum system of *Metalworking Practice* forms a closed loop.

At the same time, the school can also cooperate with relevant departments and employers to formulate assessment standards according to the industry grade appraisal standards issued by the state, enterprise employment standards, and the actual situation of schools and localities, so as to encourage students to obtain skill level certificates through internships, improve students' vocational skills and employment competitiveness, and increase the connection with employers. The new assessment method also fully embodies the ideological and political goal of strengthening the "social responsibility" of the curriculum.

evaluation mode		evaluation content	proportion	total proportion	Curriculum goal				ideological and political goal		
					1	2	3	4	1	2	3
Procedural assessment	Attendance discipline	Check attendance, absenteeism, late arrival, early departure	20%	50%	✓	✓	✓			✓	✓
	students' participation	Attentive listening, interaction, engagement, interest	20%			✓	✓			✓	✓
	Equipment operation specification	Labor discipline and safety	20%			✓	✓		✓	✓	✓
	Practice report	Completed on time, neat format, clear expression, accurate discussion	40%					✓	✓	✓	
	total				100%						
Final assessment	practical operation ability	Machining specimen achievement, size, surface roughness, assembly	100%	50%	✓	✓	✓		✓	✓	✓
total			100%								

Figure 6. The evaluation method of *Metalworking Practice*

#### 4. Effect of Ideological and Political Reform in Metalworking Practice Curriculum

The ideological and political construction of *Metalworking Practice* has been recognized by peers and students inside and outside the school. In 2021, the three majors of Industrial design, construction energy and food science of the School of Biochemistry have successively joined the metalworking practice team of our college. Relying on the ideological and political construction of *Metalworking Practice* curriculum, in 2022, the faculty team successfully applied for the school-level key project of "Teaching Reform and Implementation of Metalworking Practice Course based on OBE Concept". In 2024, it successfully applied for the university-level key project of "Virtual Simulation Experiment of Casting Process and Equipment".

After the implicit integration of ideological and political elements into the teaching content, the quality of students' striving for excelsior and Innovative Thinking has been significantly improved, which can be seen from the enthusiasm of students to participate in the internship and their interest in the finished product of the internship. The after-class practice report is closely connected with the forefront of science and technology in knowledge, and further stimulates students' divergent thinking in question types. Figure 7 shows the students' practice results after the curriculum ideological and political construction.

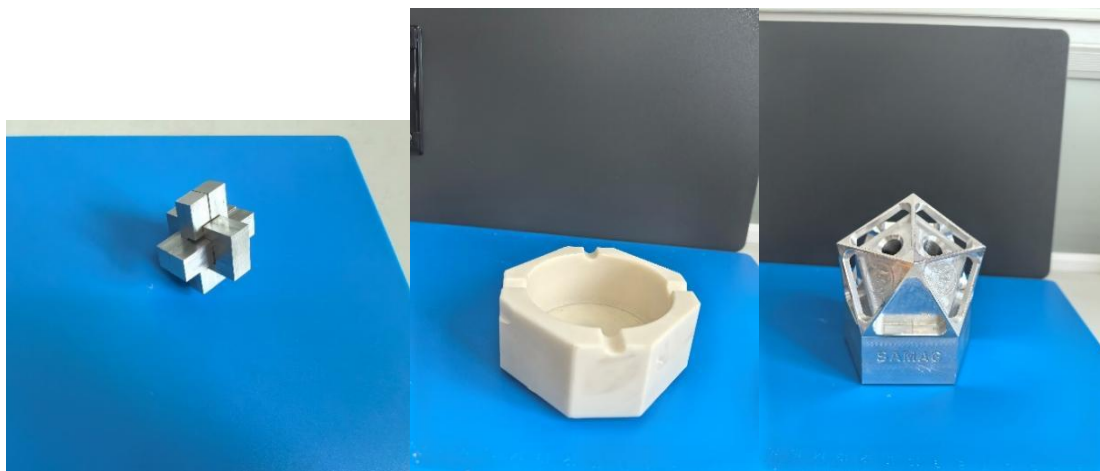


Figure 7. Student practice results after ideological and political construction

#### 5. Conclusion

Keep up with the reform situation and pace of colleges and universities in the new era, analyze the current situation and learning situation of ideological and political construction of *Metalworking Practice* curriculum in Application-oriented Universities, dig deeply into the ideological and political elements of *Metalworking practice* curriculum, give full play to the advantages and characteristics of practical classroom in ideological and political construction and fully integrate into practical teaching, not only broaden the methods and ideas of practical teaching. Moreover, it deepens the application experience of students' comprehensive engineering skills, which not only gradually optimizes the ideological and political construction of the curriculum *Metalworking Practice*, which is required for talents training in Application-oriented Universities, but also lays a solid foundation for the ideological and political construction of other practical curriculum.

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