

# **The Construction and Practice of an Integrated System for the Fusion of Expertise and Ethics and Political Education in the Curriculum Cluster of Applied Undergraduate Universities**

**Fang Wang\*, Hongfang Qi, Fengxia Zhu**

*School of Intelligent Manufacturing, Wuhan Huaxia Institute of Technology, Wuhan, Hubei, China*

*\*Corresponding Author.*

**Abstract:** Against the backdrop of the national “Double Ten Thousand Plan for First-Class Majors”, this study focuses on analyzing the challenges faced by applied undergraduate universities in the construction of curriculum clusters that integrate expertise with ethics and political education. Taking the example of the Mechanical Design, Manufacturing, and Automation Major, the research proposes systematic teaching reform strategies and establishes a professional curriculum cluster system called the “fusion of expertise and ethics and political education”. This will provide valuable reference for the curriculum construction of applied undergraduate universities.

**Keywords:** Applied Undergraduate Universities; Curriculum Cluster; Fusion of Expertise and Ethics and Political Education

## **1. Introduction**

In the context of the national “Double Ten Thousand Plan for First-Class Majors”, curriculum development remains the focal point of higher education institutions, with the integration of ethics and political theories teaching in all courses being a crucial component. Universities have actively responded to policy requirements by ensuring that ethics and political education is incorporated into every course, and that faculty members are consistently nurturing students, yielding significant results. This has led to an enhancement in the awareness and capability of educators to educate and cultivate students, as well as an overall improvement in students' comprehensive qualities.

However, as the integration of ethics and political education in curriculum development progresses, various issues have emerged:

Applied undergraduate universities, in their endeavor to incorporate ethics and political education into their curricula, have not been able to differentiate themselves from research-oriented undergraduate institutions, thereby failing to reflect their distinctive connotations and characteristics. Furthermore, there is a lack of shared ethics and political education resources and communication mechanisms among different specialized courses, making it difficult to establish a situation of complementary strengths and shared resources. The implementation of ethics and political education appears fragmented and disjointed, failing to form a coherent educational system, among other challenges.

Based on the standards of first-class curriculum development and the principles of integrating ideology and political education into curricula, our team, from a broader perspective, aims to reform traditional teaching content and modes, and promote the construction of the “fusion of expertise and ethics and political education” framework within the curriculum clusters of applied undergraduate institutions. Taking the example of the Mechanical Design, Manufacturing, and Automation major (hereinafter referred to as the “Mechanical and Automation” Major) at applied undergraduate universities, we intend to analyze the essence of the “fusion of expertise and ethics and political education” within the curriculum clusters and to construct a system for the “fusion of expertise and ethics and political education” within the specialized courses of applied Mechanical and Automation Major. Additionally, we will conduct a comprehensive study of the implementation path for “fusion of expertise and ethics and political education” from the perspective of the entire major.

## **2. Research on the Essence of the “Fusion of**

### **Expertise and Ethics and Political Education” within Applied Undergraduate Curriculum Clusters**

Applied undergraduate education is a form of higher education built upon a foundation of senior high school education (or its equivalent). Its primary focus lies in cultivating technical professionals who engage in technical applications, production implementation, and on-site management [1].

There exists a fundamental distinction in the cultivation of talent between applied undergraduate institutions and research-oriented undergraduate institutions. The objective of research-oriented undergraduate institutions is to produce research-oriented and academic talent for society. Their curriculum design is tailored to systematic disciplinary knowledge systems, characterized by a predominant emphasis on theoretical teaching and a leaning towards academic research. Conversely, the objective of applied undergraduate institutions is to supply society with practical, technical talent. Their curriculum is designed based on the abilities or qualities required for professional roles, demonstrating a parallel emphasis on theoretical and practical teaching, with a focus on application. As a result, the talent cultivation objectives, talent development plans, and specialized curriculum systems between the two types of institutions differ significantly. In the process of cultivating talent, applied undergraduate institutions must emphasize the cultivation and training of students' engineering practical capabilities.

However, many applied undergraduate institutions are originally transformed from local undergraduate institutions and initially face numerous challenges. To a certain extent, they rely on the operational models of research-oriented undergraduate institutions at the outset, either directly borrowing or making slight modifications to their talent cultivation plans. With the guidance and development of the policy system, applied undergraduate institutions must not overlook the fundamental differences in talent cultivation between the two types of institutions. The objective of applied undergraduate institutions is to supply society with high-quality practical technical talent, with the educational philosophy, curriculum systems, teaching methods, and models aligning with this objective. Specifically in the realm of first-class curriculum development and the integration of

ethics and political education within the curriculum, institutions should elucidate their own connotations and characteristics. The development of applied talents emphasizes a “craftsman spirit”, while the cultivation of research-oriented talents focuses more on the discovery of scientific problems and the establishment of scientific value.

### **3. The Construction of the “Fusion of Expertise and Ethics and Political Education” System within the Curriculum Cluster of the Applied Mechanics and Automation Major**

A professional curriculum cluster consists of integrated series of logically related courses, with each course featuring interconnected and complementary content. Taking the example of the Applied Mechanics and Automation Major at Wuhan Huaxia Institute of Technology, let's delve into the construction of the “fusion of expertise and ethics and political education” system within the professional curriculum cluster.

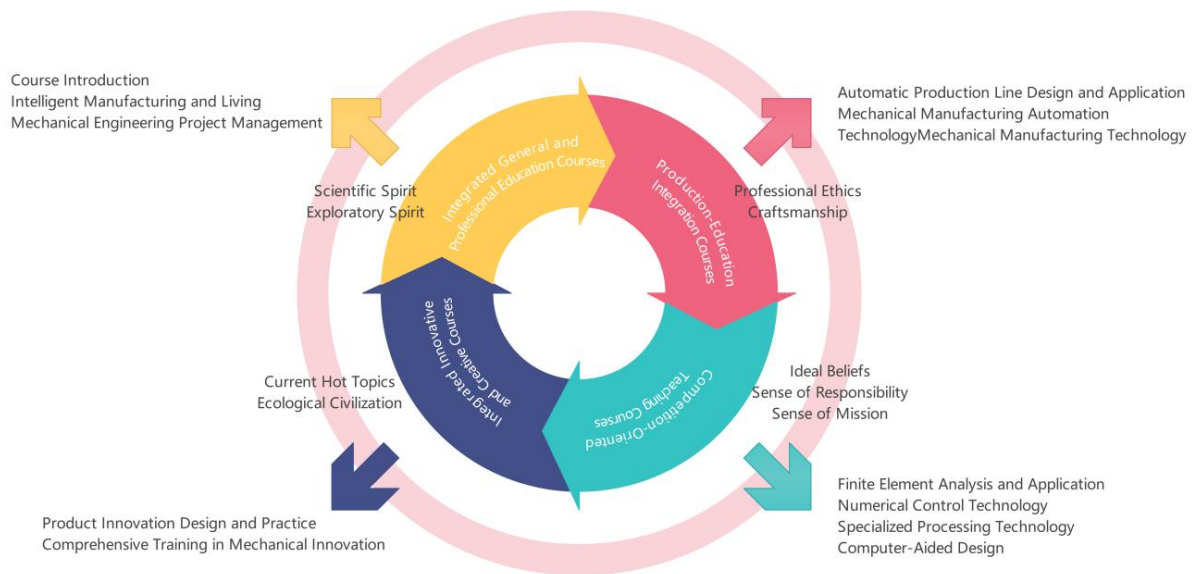
Traditional curriculum clusters are integrated and categorized based on course content, such as courses in mechanical design, manufacturing, and automation. This approach aligns the cluster of courses based on the horizontal connections between professional courses and the laws of talent cultivation. This method is advantageous for content integration and structural optimization, as it involves the elimination of redundant knowledge in certain disciplinary fields and the introduction of advanced content in the field of study. As an applied undergraduate institution, Wuhan Huaxia Institute of Technology's Applied Mechanics and Automation Major, rooted in the context of cultivating outstanding talent in Hubei Province, and based on the cultivation of engineering qualities, has formulated a distinctive curriculum system for the major. In the early stages of the program's development, the focus was on teaching reforms and practical approaches around the horizontal curriculum clusters, mainly delving into fundamental knowledge in areas such as mechanical design, manufacturing, control, and testing, while providing training in the skills and engineering capabilities of mechanical engineers [2].

Over the years of professional and curriculum development, a solid foundation has been accumulated. The affiliated discipline of mechanical engineering is an advantageous

characteristic discipline of Hubei Province's strategic plan for higher education institutions; the Applied Mechanics and Automation Major is a key undergraduate program cultivated independently by colleges in Hubei Province; two specialized courses have been recognized as first-class undergraduate courses in Hubei Province. The teaching team is an outstanding young and middle-aged scientific and technological innovation team in Hubei Province and an excellent grassroots teaching organization in higher education institutions in Hubei Province. Building upon this foundation, the teaching team has actively responded to the policy requirements of the national "Double Ten Thousand Plan for First-Class Majors". From a vertical perspective, they have categorized curriculum clusters based on the nature of the courses, which is more beneficial in breaking

barriers and expanding the depth and breadth of professional education. This approach contributes to the in-depth exploration, summarization, and refinement of ethics and political points, avoids the isolation of ethics and political education within the curriculum, and promotes the construction of a community for the fusion of expertise and ethics and political education within the professional curriculum clusters. The team has developed a set of distinctive courses that integrate general and expertise, integrate innovation and creation, integrate competition and teaching, and integrate production and education. Within these courses, they actively implement and practice the "fusion of expertise and ethics and political education", infusing ethics and political education throughout the entire process of professional teaching.

Applied Mechanics and Automation Major  
Professional curriculum clusters



**Figure 1. Applied Mechanics and Automation Major Professional Curriculum Clusters and Integration of Ethics and Political Education System**

By delving into the combination of professional curriculum and the integration of ethics and political education, they highlight points such as ideal beliefs, cultural confidence, and core values within the integrated general and specialized courses; in the integrated innovation and creation courses, they emphasize the spirit of exploration and scientific inquiry; within the integrated competition and teaching courses, they underscore current hot topics and ecological civilization; and within the integrated production and education courses, they bring forward points such as professional ethics, the spirit of craftsmanship, a sense of responsibility, and a

sense of mission. The construction of the applied mechanics and automation major's professional curriculum cluster and the integration of ethics and political education system are depicted in Figure 1.

#### 4. Implementation Framework of the Systematic "Fusion of Expertise and Ethics and Political Education" System within the Applied Mechanics and Automation Major

The systematic "fusion of expertise and ethics and political education" refers to the cultivation of ethics and political educational points within the curriculum system categories, creating a

synergistic force for nurturing students within the curriculum clusters. Different types of courses have varying emphases on ethics and political education goals and elements. In a scientific manner, these are structured according to the hierarchical levels of professional curriculum clusters, and the educational objectives are achieved through classroom teaching, extracurricular activities, and social practices.

Under the context of being a “Double First-Class” institution, the current status of ethics and political education within the curriculum in applied undergraduate institutions is analyzed. In response to the shortcomings existing in the current “fusion of expertise and ethics and political education” development [3], a comprehensive approach is taken to the overall construction of the “fusion of expertise and ethics and political education” within the curriculum clusters of the Applied Mechanics and Automation major, focusing on five aspects: the top-level design of the “fusion of expertise and ethics and political education”, standards of ethics and political theories teaching in all courses, teaching resource development, research on teaching methods, and the assessment of teaching effectiveness. The framework for the systematic implementation path of the “fusion of expertise and ethics and political education” within the applied mechanics and automation major's curriculum cluster is illustrated in Figure 2.

#### **4.1 Top-level Design of the “Fusion of Expertise and Ethics and Political Education”**

Aligning with the distinctive features of the Applied Mechanics and Automation Major, the development of the “fusion of expertise and ethics and political education” plan emphasizes seamlessly integrating ethics and political education into the professional knowledge system. This preserves the disciplinary professionalism while reinforcing comprehensive student development. Grounded in the professional curriculum clusters of the Applied Mechanics and Automation Major, the emphasis is on cohesive development, ensuring that ethics and political elements are not scattered or duplicated. Rather than individual efforts, the professional faculty collaboratively ensures the interconnection and mutual cooperation of the courses, achieving an organic fusion of value cultivation, knowledge

impartation, and skill development. This effectively circumvents the phenomenon of ethics and political education being isolated within the professional course curriculum.

#### **4.2 Implementation of Standards of Ethics and Political Theories Teaching in All Courses**

Within the first-class curriculum development standards, under the primary indicator point 3 of “Keeping the Course Content Up to Date”, subpoint 3.1 emphasizes the implementation requirements of the ethics and political theories teaching in all courses, tightly integrating value cultivation, knowledge impartation, and skill development through close fusion of professional knowledge education and ethics and political education [4]. Analyzing the development of the curriculum's essence, there is a clear focus on the implementation standard of the ethics and political theories teaching in all courses within the first-class curriculum development standard.

#### **4.3 Development of Teaching Resources**

The establishment of a high-quality resource database for ethics and political theories teaching in all courses encompasses a diverse array of resources, including teaching cases and instructional videos. Based on the professional characteristics and centered around the concept of “craftsmanship”, ethics and political elements within the profession are excavated, refined, selected, and integrated from the humanities to technology, from individuals to society, and from domestic to international, forming a shareable resource database. Emphasis is placed on the selection of current hot topics and popular cases, ensuring the novelty and relevance of the cases to maximize student engagement [5].

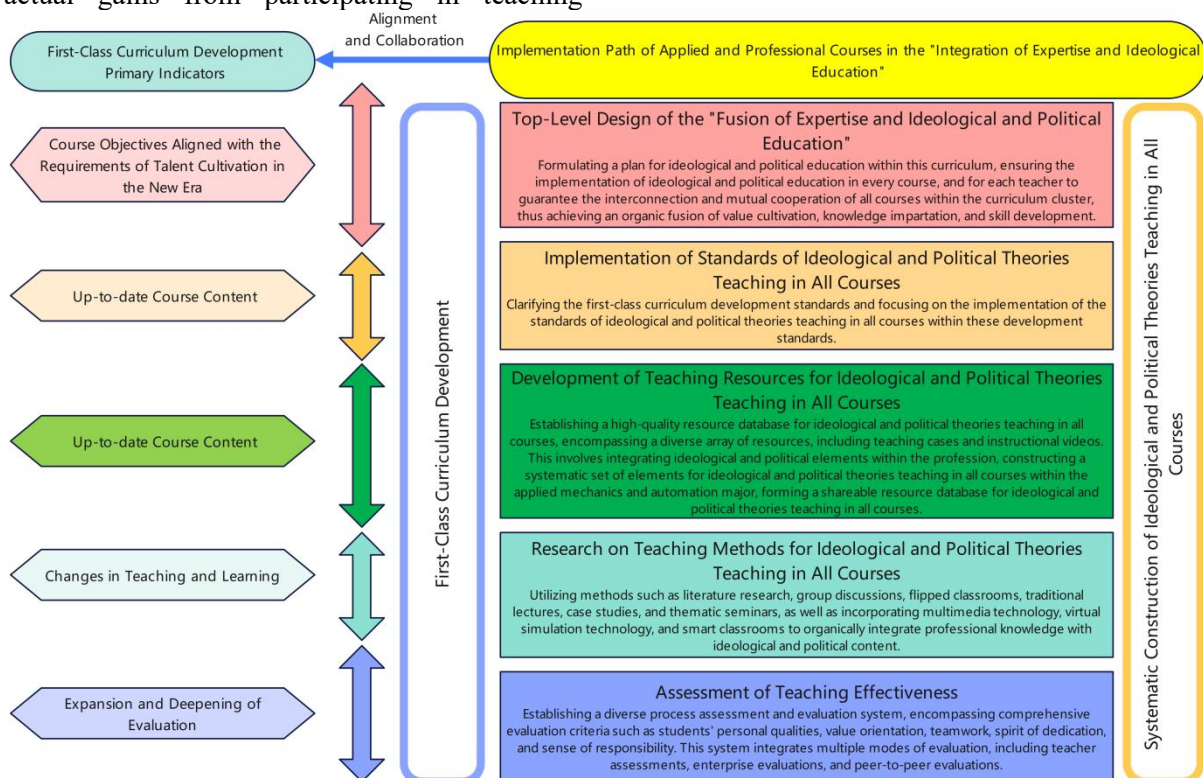
#### **4.4 Research on Teaching Methods**

Innovative teaching methods, especially the method of ethics and political points, it is different from the ordinary teaching methods. Can not be blunt, can not be abrupt, to really do the spring breeze rain, moistening things silently, can make students resonate. Creative use of a variety of teaching methods, including but not limited to: group sharing, flipped classroom, project teaching and other methods, the use of multimedia technology, virtual simulation technology, smart classroom and other technologies, the professional knowledge and ethics and political content organic integration.

#### 4.5 Assessment of Teaching Effectiveness

Deepening the evaluation and broadening the scope, continually elevating the quality of course development, serves to objectively assess the degree of integration between knowledge impartation and ideological enlightenment [6], and value guidance in the “fusion of expertise and ethics and political education” teaching. This evaluation examines students' learning experiences in post-course instruction and their actual gains from participating in teaching

activities, thereby assessing teaching effectiveness [7]. Assessment may involve establishing a diverse process assessment and evaluation system, focusing on comprehensive assessments centered around students' “personal qualities, value orientations, teamwork, spirit of dedication, and sense of responsibility” and other assessment indicators. This process may also integrate diverse modes of evaluation, including teacher assessments, corporate evaluations, and peer assessments [8].



**Figure 2. Systematic Implementation Framework of the “Fusion of Expertise and Ethics and Political Education” within the Applied Mechanics and Automation Major Curriculum Cluster**

#### 5. Conclusions

The Applied Mechanics and Automation Major of Wuhan Huaxia University of Technology integrates first-class curriculum development with ethics and political theories teaching in all courses, providing a systematic plan and construction for the “Fusion of Expertise and ethics and political Education” from the perspective of the entire major. ethics and political education is embedded throughout the entire process of professional education, including the establishment of a unified curriculum resource, the refinement of themes of ethics and political theories teaching in all courses, and the systematic transformation of curriculum construction. This approach aims to

enhance the ethics and political literacy of professional teachers, improve their curriculum development abilities, and elevate the quality of curriculum construction.

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2. This study is one of the research achievements

of the teaching reform project “The Construction and Practice of the Integration System of ethics and political Education within the Applied Mechanics and Automation Major Curriculum Cluster from the Perspective of First-Class Courses” at Wuhan Huaxia University of Technology. (Project Number: 2303)

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