

# Research on Ideological and Political Education Reform of "Communication Principle" Course under Blended Teaching Mode

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**Abstract:** "Curriculum Ideology" is a new model of higher education. Taking the Communication Principles course of the Communication Engineering major at Hezhou University as an example, the article plans the path for the construction of curriculum ideology based on the characteristics of the course, using a blended online and offline teaching model as the carrier, for three dimensions: teaching objectives, teaching the process, and teaching content. From the effects of teaching practice, it can be seen that under the blended teaching model, curriculum ideological teaching leverages the ideological and educational functions of teaching resources, teaching methods, and teaching evaluation, achieving more significant learning outcomes.

**Keywords:** Curriculum ideological and political education, Principles of Communication, Blended learning

## 1. Introduction

Course-based ideological and political education is a fundamental approach for higher education institutions to implement the essential task of fostering virtue through education, to build a comprehensive educational pattern involving all staff, throughout the entire process, and in all aspects, and to promote the construction of first-class disciplines and specialties [1]. Currently, the core and key to achieving the connotative development of higher education is to integrate the "invisible" educational system of ideological and political work into the "visible" professional system, the curriculum system, and the teaching system, ensuring that ideological and political education and professional teaching are unified in knowledge and action. Based on the reference literature and experiences of various universities [2-5], each relatively independent ideological and political element is initially extracted, and then combined with corresponding professional course content, ideological and political education is conducted while explaining professional course.

"Communication principle" is a relatively difficult course that is based on a certain level of mathematics and deals with information transmission technology. It requires students to have strong logical analysis skills and the ability to explain the "physical process" of communication based on mathematical principles. Students need to possess strong abilities to analyze and solve problems, that is, "critical thinking" skills. Therefore, in the teaching process, how to integrate the "intangible" education of ideological and political aspects into the "tangible" teaching of professional courses using a mix of online and offline teaching methods, to meet the new demands of professional accreditation for engineering education on talent cultivation, thus enhancing students' engineering awareness and innovative abilities, and achieving comprehensive education, has become an important issue in higher education reform in the context of the new era.

## 2. Analysis of the Current Teaching Status of "Communication principle"

"Communication principle" is a core professional course for communication engineering majors. Due to the abundance of mathematical formulas, extensive and abstract content in the course, it leads to a lack of interest and initiative in learning among some students. The main issues in the teaching of this course include the following aspects.

(1) The teaching methods are monotonous and boring, and the integration of ideological and political

elements into the teaching process is obviously insufficient. Currently, some university teachers have failed to keep pace with the times and still adopt the outdated "cramming" teaching model, ignoring the subjectivity and initiative of students. This simple method of lecturing and indoctrination also limits the integration of ideological and political elements, making it difficult to resonate with students and provoke their thinking. As a result, the learning interest and enthusiasm of students can't be high, and the learning effect and comprehensive quality cannot be improved.

(2) Teachers lack ideological and political awareness. The vast majority of professional teachers generally believe that ideological and political education should be undertaken by specialized ideological and political courses, while their own responsibilities are limited to imparting professional knowledge. In the process of classroom teaching and interaction between teachers and students, some teachers focus excessively on the transmission of knowledge and the training of skills during teaching, lacking a keen insight into and proactive guidance of students' ideological trends. This phenomenon of "emphasizing intelligence over morality" is not only detrimental to the comprehensive development of students, but also likely to create hidden dangers in the future society.

(3) The content of teaching is relatively lagging behind and cannot achieve the integration of ideological and political elements. With the rapid development of communication technology and the adjustment of industrial structure, new technologies such as 5G, quantum communication, and artificial intelligence are evolving rapidly. Due to the constraints of class hours, these new theories and technologies cannot be fully discussed and applied for expansion. Therefore, the content of teaching may not be able to keep up in a timely manner, leading to a gap between the knowledge students learn and the actual job requirements.

(4) The way of curriculum assessment is too simple, and the teaching evaluation lacks ideological and political content. Most of the assessment methods of "Communication principle" are still based on closed-book theory exams, and the usual scores are mainly composed of attendance, homework and other links, resulting in most students "cramming" can also get credits. In addition, the evaluation system obviously lacks the evaluation link of curriculum and politics, which reflects the tendency of "attaching importance to teaching and neglecting to educate people" to a certain extent, and ignores the concern and training of students' moral education development.

### **3. Research on curriculum ideological and political teaching**

#### ***3.1 Reshaping the goals of ideological and political education***

"Communication principle" as an important professional foundational course for electronic information disciplines, bear the responsibility of cultivating students' patriotic feelings and sense of mission to serve the country with science and technology. The goal of ideological and political construction of the course is to strengthen students' belief in "never forgetting the original aspiration of serving the country with science and technology, and remembering the mission of strengthening the nation with technology." It aims to foster in students the spirit of "dedication, precision, meticulousness, and pursuit of excellence" typical of great national craftsmen, as well as the spirit of scientists characterized by "patriotism, innovation, pragmatism, dedication, collaboration, and education." The course also seeks to promote the spirit of "Guangxi Wolf Soldiers"—resilience and teamwork—and to strive tirelessly for the independent control and international leadership of key technologies in China's electronic information industry.

#### ***3.2 Exploring the ideological and political elements in communication principles***

##### ***3.2.1 Patriotic spirit***

As we examine the magnificent journey of our country's mobile communication technology, we see a progression from "following in the 2G era, breaking through in 3G, walking side by side in 4G," to "leading the way in the 5G era." Chinese communication giants like Huawei and ZTE have secured the largest number of 5G essential standard patents globally. Behind this series of technological leaps, several generations of communication researchers have made unremitting efforts and committed to innovation, and they have written brilliant chapters with full patriotic enthusiasm. In the first chapter of the Communication Principles course, we explore how China's communication technology has grown from a catch-up to a leader. This journey is not only a profound interpretation of patriotism and feelings of scientists, but also a vivid teaching material that inspires students' national pride, professional confidence

and mission.

### ***3.2.2 The spirit of the master craftsman in great nations***

As a core professional spirit, the spirit of the master craftsman is deeply rooted in a rigorous and meticulous work attitude and the continuous pursuit of excellence in the work philosophy. It is undoubtedly an indispensable part of the ideological and political education system. The practical aspects of communication principles happen to create an environment for the cultivation of the spirit of the master craftsman. In the experiment of pulse code modulation technology, the brilliant achievements of academician Wu Hequan, a shining star in the field of communication and information systems, are cleverly integrated. This allows students to experience the profound spirit of the master craftsman and a strong sense of patriotism from scientists up close in practice. This vivid form of education not only stimulates students' love and pursuit of technology but also plants the seeds of striving for excellence and courage to take responsibility in their hearts.

### ***3.2.3 The scientist spirit***

The spirit of scientists is the soul of science and technology, and the invention of every new technology in the communication principle is the development of scientific spirit. The natural introduction of inventors' stories and great achievements in the telling of these theoretical technologies not only adds interest to the curriculum, but also inspires students to learn from scientists. For example, before learning the channel capacity calculation formula, first introduce Shannon's life story; When learning the sampling theorem in source coding, this paper introduces Nyquist's struggle and so on. By telling these examples of scientists using technology to change people's lives, students can understand the connotation of the scientific spirit, stimulate their interest in science, cultivate students' scientific spirit of being rigorous and serious, not afraid of authority, adhering to truth, and daring to innovate, and establish the ideal and belief that science and technology serve the country.

### ***3.2.4 The "Guangxi Wolf Soldiers" spirit***

"Guangxi Wolf Soldiers" refers to the soldiers from the Guangxi region who is known for their bravery, strict discipline, and perseverance. It is a vivid embodiment of the indomitable spirit of the Chinese nation. Integrating the "Guangxi Wolf Soldiers" spirit into the course of communication principles aims to combine history with reality, allowing students to not only master professional knowledge but also feel the resilience and strength contained in the excellent traditional culture of the Chinese nation. When explaining complex concepts in communication principles, one can try to use elements of the "Guangxi Wolf Soldiers" spirit for analogy. For example, signal transmission can be compared to "wolf soldiers" crossing mountains and ridges to convey military intelligence, emphasizing the stability and reliability of signals; the modulation-demodulation process can be compared to "wolf soldiers" flexibly using tactics in complex environments to achieve effective information transmission.

## ***3.3 Improving teachers' ideological and political literacy***

In the teaching process, a teaching team for the ideological and political education of the Communication Principles course is established, striving for a reasonable age, professional title, and the knowledge structure. The team regularly conducts teaching observations, exchanges experiences, and ideological and political training, collectively exploring the ideological and political elements embedded in the course. They develop and integrate ideological and political resources, fully utilizing the well-established online course resources to enhance the teaching and educational capabilities of the team teachers. The course's ideological and political education is considered a normalized teaching philosophy, guiding the entire teaching process. According to the feedback of students, the teaching method should be updated constantly, and the effective teaching approaches suitable for the ideological and political education of the Communication Principles course are explored. Emphasis is placed on knowledge transmission, ability enhancement, and value shaping, cultivating high-quality talents who love their country and have all-around development in moral, intellectual, physical, aesthetic, and labor aspects.

## ***3.4 Improving ideological and political teaching evaluation methods***

Construct a diversified curriculum ideological and political teaching evaluation system, implement a two-way evaluation system, and improve teaching quality. At the level of teachers, the teaching quality and ideological and political evaluation indicators are introduced into the teaching assessment and evaluation of the professional title of teachers, so as to improve the ideological and political education level of professional teachers. At the student level, students' classroom performance, extracurricular

practice, project report, etc. will be included in the performance assessment, and ideological and political evaluation related to learning attitudes, ideals, beliefs and values will be established. At the same time, we should pay attention to students' feedback on the curriculum ideological and political education, promote teachers' teaching reflection and the continuous improvement, and constantly improve the educational level of curriculum ideological and political education.

#### 4. Research on curriculum ideological and political teaching

With the help of the teaching platform of Superstar Learning, the "online + offline" mixed course ideological and political teaching model is constructed to carry out the teaching practice of communication principles course.

##### 4.1 Constructing the curriculum ideological and political construction mode of "virtue and ability combined with cultivation, four learning thinking and integration"

As shown in Figure 1, this course is guided by the value orientation of ideological and political education and the teaching of "communication principles", integrates education requirements and value education into the curriculum, builds a curriculum ideological and political construction model of "moral ability and cultivation, four learning thought integration" to achieve "three-in-one education", and adopts the integrated teaching mode of blended offline physical classroom teaching and simultaneous online live broadcast. The ideological and political elements of the course are imperceptibly integrated into the knowledge points of the "Communication principle" course, so as to achieve the "trinity" course teaching objectives of shaping core value, cultivating comprehensive ability and exploring multi-dimensional knowledge.

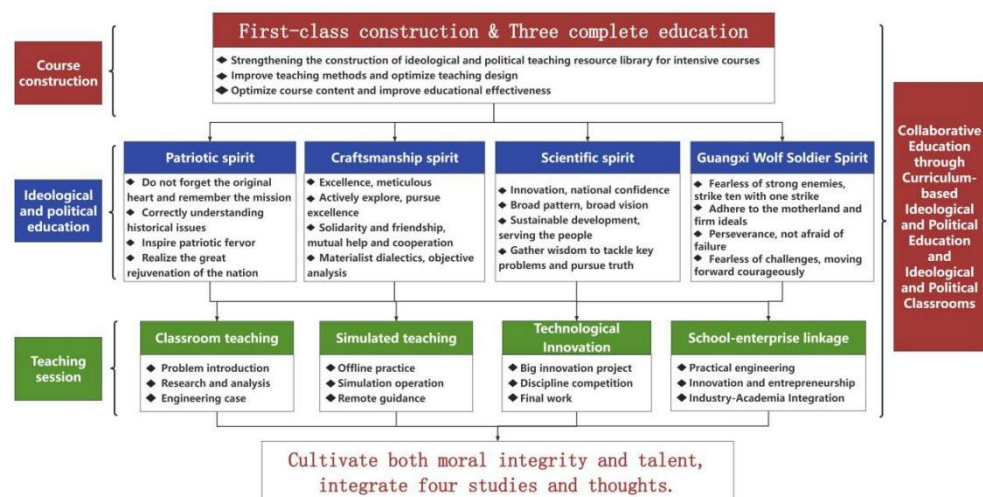


Figure 1: Curriculum ideological and political construction mode.

##### 4.2 Integrating ideological and political elements into the teaching process

###### 4.2.1 Designing Teaching Activities for "Blended Online and Offline + Ideological and Political Education"

In the training mode of online and offline mixed courses of this course, rain classes are regularly used online to test learning effectiveness, and different ideological and political education programs are designed according to the test results, and flipped classes are taught offline. Multiple measures should be taken to stimulate students' interest in learning and improve the quality of teaching. The rain classroom is used to conduct interactive classroom teaching, design course discussion content, innovate teaching methods, integrate into curriculum thinking and politics, create a student - dominated and teacher - led teaching paradigm of "asking for new knowledge and preparing to show theory", and build a new teaching integration model of "live broadcast + learning communication + flipped classroom + remote simulation", as shown in Figure 2. Before class, the teacher assigned the discussion topic of the course content, and the students prepared it online and offline. Students in the class explain and discuss, share the harvest, teachers ask questions and heuristic summary. After class students are happy to consolidate

knowledge and innovative thinking. The course practice uses Matlab to conduct theoretical simulation of communication principles, such as analog modulation system simulation, 2ASK modulation and demodulation simulation, 2FSK modulation and demodulation simulation, etc., and forms a design report and defense, so as to cultivate students' ability of communication system engineering design. While learning the basic knowledge of communication, students can understand the development history, the development trend, research hotspot, scientific innovation and cutting-edge applications of communication, cultivate students' scientific thinking methods and critical thinking ability, and improve students' ability to correctly understand, analyze and solve problems.

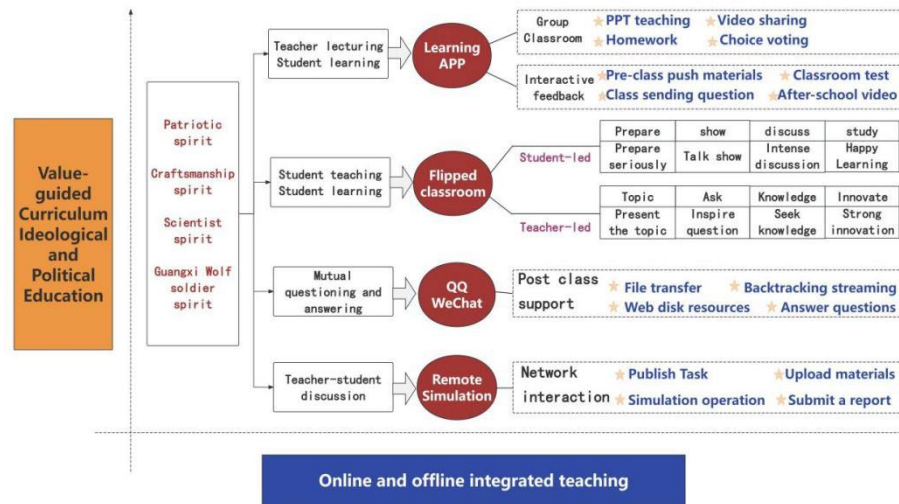


Figure 2: Curriculum ideological and political teaching design.

#### 4.2.2 Developing a comprehensive ideological and political education assessment framework for courses

We will deepen reform of the process evaluation system. As shown in Table 1, a multi-dimensional and multi-dimensional evaluation and assessment system integrating knowledge and skills, process methods, ideological and political attitudes, etc. should be established, online classroom test and assessment methods should be added, and online feedback mechanism should be introduced to more fully and comprehensively reflect the effectiveness of the combination of ideological and political education and ability and quality education. No matter small class discussion or large class, the final assessment accounts for 70%, and the remaining 30% includes classroom testing, online learning, online and offline discussion interaction, the classroom performance (including ideological and political interaction), classroom activities, homework and other processes diversified assessment.

Table 1: Diversified curriculum ideological and political teaching evaluation system design.

|         | Example column 1 Regular grades(30%)                          |                                | Final grades(70%)     |
|---------|---|--------------------------------|-----------------------|
| Online  | Classroom Test 40%  |                                |                       |
|         | Online learning   | Homework completion status 10% |                       |
|         |   | Online learning duration 10%   |                       |
|         |   | Online discussion 10%          |                       |
|         |   | Online check-in 10%            |                       |
| Offline | Classroom activities 10%                                      |                                | Paper examination 70% |
|         | Class performance (ideological and political interaction) 10% |                                | Practical Report 30%  |

#### 4.3 Integrating ideological and political elements into teaching content

Deeply explore the ideological and political teaching resources of courses, build a case base for ideological and political education in courses, explore the teaching model of ideological and political education in courses, enhance teachers' ability to build ideological and political education in courses, and organically integrate value shaping, knowledge transmission, and ability cultivation. Centering on the spirit of patriotism, the spirit of great craftsmen of the nation, the spirit of scientists, and the spirit of "Guangxi Wolf Soldiers", represented by red leaders, academic masters, engineering giants, industry leaders, and pillars of national governance, constructs a network map that connects 17 ideological and political elements with knowledge points. On the basis of this network map, the combination points of

knowledge points and ideological and political elements are sorted out, as shown in Table 2.

Table 2: Course content Course ideological and political are designed.

| Theme   | Course content                                   | Ideological and political elements   | Ideological and political case   |
|---|--|--|--|
| Patriotic spirit                                | History of Communication Development             | Understand history, inspire patriotic passion.                               | Case : Introduce the history of communication systems, while allowing students to understand the current state of China's communication field, as well as the fact that Huawei has been focusing on fifth-generation communication technology in recent years and has been sanctioned by the United States, to inspire students' patriotic fervor and encourage them to engage in the course learning independently.   |
|   | Components; Performance of Communication Systems | Realize national rejuvenation, establish correct values.                     |  |
|   | Inter symbol interference and noise              | Stay true to our original aspiration and keep our mission firmly in mind.    |  |
|   | Error correction coding                          | Correctly understand historical issues, remember history.                    |  |
| The spirit of master craftsmen in great nations | Stochastic process                               | Eagerly explore, pursue excellence.  | Case: By studying the design process of the optimal receiver, students are trained to develop a belief in continuous improvement, establish goals of pursuing excellence, and help students cultivate a rigorous attitude, value skills, and form the habit of concentration.  |
|   | Partial response system                          | No work is also good, there is love and cooperation                          |  |
|   | Encoding modulation                              | Drawing inferences and making objective analysis                             |  |
|   | Common simple encoding                           | Materialist dialectics   |  |
|   | Best receiver                                    | Strive for excellence  |  |
| Scientific spirit                               | Sampling Theorem                                 | Have the courage to innovate   | Case: Before learning the channel capacity calculation formula, introduce Shannon's life story; When learning the sampling theorem in source coding, this paper introduces Nyquist's struggle and so on. By telling the life stories of great scientists, students can understand the scientific spirit of preciseness and seriousness, not fearing authority, adhering to truth, and daring to innovate.  |
|   | Channel capacity, channel digital model          | Not afraid of authority, adhere to the truth.                                |  |
|   | Eye Diagram                                      | Broad perspective, original vision   |  |
|   | Digital Modulation                               | Sustainable development awareness  |  |
| Guangxi Wolf Coin Spirit                        | Simulated modulation system                      | Perseverance and teamwork.   | Case: Comparing the transmission of signals in a simulated modulation system to "wolf soldiers" crossing towering mountains to convey military intelligence, highlighting the stability and reliability of the signal; comparing the modulation-demodulation process to "wolf soldiers" flexibly employing tactics in a complex environment to achieve effective information transmission. This allows students to deeply understand the indomitable and valiant qualities of the "Guangxi wolf soldiers". |
|   | Reusing  | Invincible and fierce, able to defeat ten with one.                          |  |
|   | Noise resistance performance                     | Fear no difficulties, forge ahead bravely.                                   |  |
|   | Synchronize                                      | Align with the destiny of the motherland, and strengthen ideals and beliefs. |  |

## 5. Research results

### 5.1 A set of ideological and political resource base for online communication principles course is built

The resource library of the online course "Communication principle" is built with the help of the learning platform, which contains the teaching of each chapter, the double outline goal of educating people, the teaching design of ideological and political courses, the teaching cases of ideological and political courses, the micro-lessons, and the supplementary series of information of ideological and political courses.

### 5.2 Significant improvement in students' academic performance

To study the teaching efficiency of the ideological and political education reform of the "Communication principle" course under the hybrid teaching model, the first class of the communication engineering major in the 2020 cohort was used as the experimental class for the reform, while the second class continued with the traditional teaching model. After one year of construction and implementation, the distribution of course objectives achievement for both classes is shown in Figures 3.

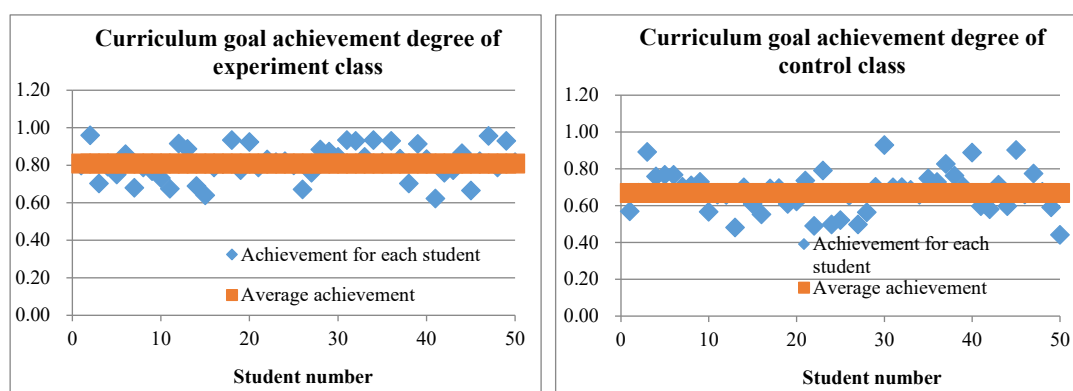


Figure 3: Comparison chart of course goal achievement.

As can be seen from the graph, the average achievement level of the experimental class has significantly improved compared to the control class, and the distribution of student achievement is more concentrated. Compared with the traditional teaching model, the learning effects of ideological and political education in courses are more significant under the blended teaching model. By effectively connecting ideological and political cases with course content, leveraging the functions of teaching resources, teaching methods, and teaching evaluation in ideological and political education, the intrinsic motivation of students is stimulated.

## 6. Conclusion

The course "Communication principle" has a profound impact on the personality shaping and professional development of undergraduate students in communication majors. Implementing ideological and political education within a blended teaching model can closely integrate professional course instruction with ideological and political education, further enhancing the quality of talent cultivation and meeting the growth and development needs of students.

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