

Value-oriented Blended Teaching Design under the Background of New Agricultural Science: Taking "Cultivation of Forage and Feed Crops" as an Example

Yu Tian*, Nanyi Zhang, Hongmei Shang, Bo Xu

College of Forestry and Grassland Science of Jilin Agricultural University, Changchun, 130118, China

*Corresponding author: tianyu@jlau.edu.cn

Abstract: "Cultivation of Forage and Feed Crops" is based on the provincial first-class construction major of Grassland Science. It combines the "Guidelines for the Ideological and Political Construction of Courses in Higher Education Institutions" with the requirements of collaborative education for Grassland Science majors in light of the new era of agricultural science. The first goal of building the ideological and political foundation for this course is to cultivate virtue and nurture talent. The teacher team should take the lead, the construction of the course should be the primary goal, and classroom teaching should be the main way to achieve this. The ideological and political design concept of this course is "Rooted in the land to learn forage skills, empower grassland science to serve the country". It is guided by the spirit of grassland science, which is "ecological protection, responsibility for revitalization, integration and innovation", to build a progressive quality framework of "knowing grass, loving grass, using grass, and promoting grass". Attention will be paid to the teaching content, teaching resources, teaching models and teaching evaluation during the implementation. Given that the teaching content has many agricultural scenarios, is highly comprehensive, and has obvious practical needs, this course has reformed the knowledge system along the main line of "where to plant - what to plant - how to plant", deeply integrated cultivation principles, production practices and ideological and political education, reshaped the four-dimensional quality objectives, restructured the three-level course content, built "five-in-one" teaching resources, established the ACI blended teaching model, and set up a multi-dimensional quality evaluation system; thus, it has achieved the training goals of "solid foundation, cultivated sentiment, strong practice and ability to innovate".

Keywords: Ideological and political factors, ACI learning model, knowing grass and loving grass, multi-dimensional evaluation

1. Introduction

Higher education is the main place for cultivating excellent innovative talents and bears the heavy responsibility of educating and nurturing the people. In light of the new era, how to carry out ideological and political education in all areas of education and teaching, and how to use modern educational technology to improve the quality and efficiency of talent cultivation, have become pressing issues for higher agricultural education at present. As a core course of the Grassland Science major, the teaching reform for "Cultivation of Forage and Feed Crops" should transmit professional knowledge and also cultivate values in the direction of ecological civilization and a "grand agricultural perspective". Therefore, under the leadership of the construction of New Agricultural Science, exploring the general design, implementation path and effectiveness evaluation of ideological and political education in this course is of great theoretical and practical significance.

1.1 The Urgent Need and Call of the Times for the Ideological and Political Education of Students

Comprehensive promotion of ideological and political education in all courses can help foster moral character and cultivate talent for the construction of a good society. In 2020, the Ministry of Education released the "Guidelines for the Ideological and Political Construction of Courses in Higher Education Institutions", which clearly states that "all universities, all disciplines and majors, and all courses should take responsibility for educating students, build their own channels, create their own

responsibility fields, ensure that various courses and ideological and political courses move in the same direction, integrate explicit education and implicit education, and form a synergistic effect." This indicates a paradigm shift from "ideological and political courses" to "ideological and political construction of courses" in China's higher education; therefore, professional courses need not only transmit knowledge but also achieve the goal of integrating value shaping, ability cultivation and knowledge transmission.

There is a relatively urgent need for the ideological and political education of high school students. Agriculture is the foundation of the national economy, and the ideological and political foundation for agricultural talents directly affects whether the country can achieve food security, build ecological civilization and comprehensive rural revitalization, etc. For a long time, the professional course teaching in agricultural science has often shown a tendency to "prioritize skills over ethics"; that is to say, it has paid too much attention to explicit knowledge, such as technical parameters and physiological mechanisms of crop cultivation, and neglected the ecological ethics, patriotism and scientific spirit underlying these techniques. The educational model of "separation of knowledge and practice" cannot foster new-generation agricultural talents with a strong sense of social responsibility towards agriculture, rural areas and farmers, nor can it cultivate a sense of history. Therefore, ideological and political education for all students will be added to the school curriculum. Professional teachers need to learn in depth the ideological and political contents of the course, silently integrate the education of the "great nation's agriculture, rural areas and farmers" concept, ecological civilization ideas, and the spirit of hard work into their professional teaching, so that students can acquire professional skills and also form a correct worldview, outlook on life and value system; thus, they will achieve the fundamental shift from "talent cultivation" to "person education".

1.2 New Requirements for the Cultivation of Talents in Grassland Science in the Context of New Agricultural Science

The world is changing at an unprecedented rate today, and the new round of technological revolution and industrial transformation poses very serious problems for higher agricultural education. In 2019, with the successive release of the "Anji Consensus" and the "Beidacang Action", the construction of New Agricultural Science was fully underway. The main idea of the construction of New Agricultural Science is to "face new agriculture, new rural areas, new farmers and new ecology", break down traditional disciplinary barriers, promote cross-disciplinary integration of agriculture-engineering, agriculture-science and agriculture-humanities, and cultivate compound agricultural talents with cross-boundary thinking, innovation ability and a global perspective[1-3].

For the reasons mentioned above, Grassland Science has gained new and extended connotations in recent years. Grassland Science is often regarded narrowly as "growing grass for livestock" in the traditional view, but with the development of new agricultural science, grasslands are needed to build the ecological security barrier of our country, provide strong support for the implementation of the "grand food perspective", and serve as an essential link in achieving the coordinated development of the "grain-economy-feed" ternary structure. Talents in Grassland Science for the New Era should not only have the technical ability to "grow grass well"; they also need to have more all-around abilities. First, they need to have a deep understanding of ecological civilisation, fully grasp the development idea of "lucid waters and lush mountains are invaluable assets", and consider both ecological protection and economic development. Second, they should have a strong sense of mission and responsibility, be mindful of "national affairs," shoulder "national responsibilities," and be able to take the initiative in the face of serious strategic problems, such as ecological governance in the Northwest and the improvement of grass mountains and slopes in the South. Third, they should be able to think cross-disciplinarily and explore innovatively, using modern technological tools such as artificial intelligence, big data and biotechnology to promote the development of forage breeding and cultivation^[4].

As the core foundation course for students of Grassland Science, "Cultivation of Forage and Feed Crops" will link the theoretical knowledge of grassland science with practical application. However, the current teaching conditions for this course are still lacking in systematic collection of ideological and political content and do not meet the talent demands of New Agricultural Science. Therefore, in light of the talent profile for New Agricultural Science, the course needs to be systematically reformed to cover the latest technological frontiers in forage cultivation and highlight national strategic needs; thus, students will be able to feel the changes of the times in their professional studies and integrate their own career plans with the overall development strategy of the country.

1.3 The Primary Function of Blended Teaching in the Concept of Student-Centered Learning

The effective implementation of ideological and political education in courses and the cultivation of talents for New Agricultural Science cannot be separated from the innovation of teaching concepts and the support of teaching models. The traditional teaching method for "Cultivation of Forage and Feed Crops" is often linear, based on a "cramming method" and "monologue teaching"; in this mode, the teacher is the source of knowledge and the students are passive recipients. The "teacher-centered" mode of teaching mentioned above is good for transmitting knowledge, but it fails to achieve the goals of cultivating students' values and high-level thinking. If ideological and political education is only at the level of teachers' verbal preaching, without students' deep experience and emotional resonance, it will be very likely to result in the phenomenon of "labeling" and "separation of theory and practice", and it will be difficult to achieve "internalisation in the mind and externalisation in action" of ideological and political elements^[5].

The educational idea of "student-centred" is to start teaching from the students' needs and cognitive laws, focus on their active construction of knowledge, and promote all-around development. Based on the above idea, online and offline blended teaching has been introduced as a way to solve the problems of traditional teaching and promote deep learning. Blended teaching is not only about adding online and offline teaching materials; it is also an organisation of the teaching process that covers all time and all space before, during and after class.

In short, given the general requirements for the ideological and political education of courseware and the era-driven needs of building new agricultural science, teaching reform in the course "Cultivation of Forage and Feed Crops" is required, and blended teaching can offer strong technical and methodological support for realizing student-centered ideological and political education in courses. The subject of this paper is the "Cultivation of Forage and Feed Crops". In light of the new requirements for Grassland Science talents in the construction of the New Agricultural Science, this paper systematically elaborates on the general design concept of ideological and political education for this course and establishes the trinity teaching goal of "knowledge, ability and values". Research on the Implementation Path of Ideological and Political Education for Courses Based on Student-Centredness and Blended Teaching, and Addressing the Problem of "Rigid Labeling" in the Integration of Ideological and Political Content. It also hopes to build a multi-dimensional, whole-process evaluation system for the effectiveness of ideological and political construction in courses, provide a theoretical basis and practical model for the ideological and political construction of similar courses in higher agricultural institutions, and truly achieve the resonance and collaborative education of professional education and ideological and political education^[6].

2. Ideological and Political Teaching Practice of the Course

2.1 Optimising Top-level Design and Strengthening the Foundation of Ideological and Political Education

According to the characteristics of the course and its support for the talent cultivation plan, the top-level design of the ideological and political teaching system for this course has been revised, and 28 ideological and political elements have been extracted, such as grassland civilization, local advantages, grassroots rooting, truth-seeking and innovation, ecological security, etc.

Table 1 Indicators for the Ideological and Political Construction of the Course

First-level construction indicators	Second-level construction indicators
Patriotism	Professional Identity; Knowing and Loving Agriculture; Rural Revitalization; Dual Carbon Goals.
Industry conviction	Grassroots Rooting; Industry Service; Food Security; Revitalisation of the Seed Industry
Ecological awareness	Respect for Nature; Green Development; Crisis Awareness; The Concept of the General Situation.
Scientific spirit	Dialectical Thinking; Interdisciplinary Integration; Seeking Truth; Innovation and Teamwork
Cultural confidence	Agricultural civilization; Grassland civilization; Local advantages; Resource endowment

2.2 Restructure the Three-Level Course Content and Integrate Elements of Ideological and Political Education

Grassland science has changed from the old idea of "using grassland resources" to a modern green industry with ecological consciousness, and it has many advantages: it is technologically advanced, cross-border, meets various needs, will serve as an "ecological barrier" for the construction of ecological civilization, be an "industrial foundation" for rural revitalization, and provide "essential support" to national strategies and global governance. Reorganise the knowledge system in line with the development of the disciplines and course objectives, and the three theoretical learning modules will be "where to plant", "what to plant" and "how to plant". In-depth exploration and improvement of the ideological values and spiritual connotations of the professional knowledge system have been carried out, and carefully designed ideological and political cases have been skillfully integrated into the teaching content. The practical part is closely related to theoretical study and covers the entire process of forage cultivation: "seed selection, tillage, sowing, management, harvesting and storage"; thus, students will be able to obtain ideological and political education in practice. Organic integration of ideological and political elements into practical teaching can ensure the systematic nature and continuity of ideological and political education in the process of talent cultivation, and it is also an unavoidable demand of implementing the concept of "Three-all Education".

2.3 Building "Five-in-One" Teaching Resources and Consolidating the Carrier of Ideological and Political Education

In accordance with the FD-QM online course quality construction standards, the team has created a large number of online learning materials, and in cooperation with teachers and students, six types of ideological and political case libraries have been established: self-made micro-courses, knowledge graphs, typical figures and events, policies, cutting-edge literature, and interdisciplinary cases; a total of 129 cases have been created so far, and they will continue to be updated dynamically. Offline, students can go to smart classrooms, experimental platforms, farming and reading bases, science and technology backyards, research institutes, etc., for theoretical and practical study. After the course, the team will continue to offer platforms for social practice and disciplinary competitions to help the students develop personally and improve their abilities. Therefore, the team has set up a four-in-one system of teaching materials: online digital resources, offline physical resources, special ideological and political materials, and extended development resources^[7].

2.4 Optimisation of the Teaching Model and Opening Up the Path for Ideological and Political Education

According to the ACI (Automatic-Constructive-Interactive) learning model, all students will have personalised study plans for this course. Before class, students will study independently and the teacher will answer questions online. The teacher hands out task cards, and based on these tasks, individuals or groups will construct knowledge to achieve transfer and application of what they have learned. Offline, teachers can use all kinds of industrial and cutting-edge materials in various situations to actively participate in cooperative learning, motivate students to learn together and discuss problems, help them

correct misconceptions, and foster innovative thinking. After class, the students go back to the online platform and complete the additional exercises, notes and reflections. According to the ACI learning model, the course can overcome the deficiencies of time and place to offer personalised study and achieve good learning results.

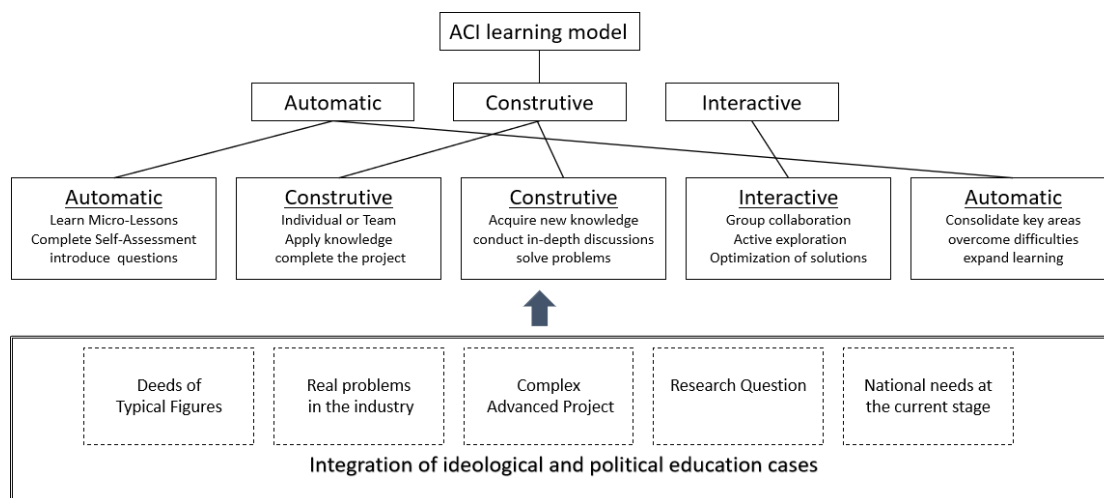


Figure.1 Implementation pathways for ideological and political education based on the ACI learning model

All parts of the course are integrated with ideological and political cases, and the pathway for ideological and political education has been extended from "knowing grass and loving grass" to "using grass and promoting grass." Through progressive linkages of "profession, industry and national needs", this course helps students gradually form the belief that "the profession has value, the individual has ability, and struggle has direction", and finally strengthens their will to take practical action for the benefit of the country, achieving deep integration of ideological and political education with professional education.

3. Course Evaluation and Effectiveness

3.1 Construct a Multi-dimensional Evaluation System

The course will construct an assessment system for all links in teaching. There are many ways to measure quality objectives, and all of them have their own strengths. Machine evaluation will be employed to grade teaching cases, and pre-class tests will be given to collect information on the progress and quality of self-study. Machine grading and teacher evaluation will both be used for the after-class homework, and teachers may add their own comments on the quality. Class participation will be accounted for in the course credits based on both the quantity and quality of student participation. For group tasks, all aspects of students' development in cooperation, communication and creativity will be assessed both within the group and by the teacher.

3.2 Effectiveness of the Ideological and Political Teaching Reform for the Course

Students have feelings about their studies, are more motivated to learn, and think deeply about the content. Students learn about the case of planting forage on saline-alkali land improved in class, study related materials and put forward practical implementation plans. Students who had not been studying before are now very interested in the case of the development of the forage industry in Tibet and actively collect materials and prepare presentations for their groups. In their group activities, the students have formed some good ideas on sustainable development and the role of grassland science in promoting rural revitalization.

The value of "knowing grass and loving grass" is realised through the practice of the "mission to promote grass" by students. Given that the first-choice rate for freshmen is less than 50%, the proportion of graduates who pursue postgraduate studies or are employed in their major fields has been gradually increasing. Some students choose to return to their hometowns and work in county towns, county-level cities, departments of border forestry and grassland management, agricultural enterprises,

etc.

4. Outlooks

4.1 Enhancing the Depth of Ideological and Political Cases via Multiple Channels

The course has many materials for the cultivation of virtue and the training of talent; the ideological and political case materials are updated regularly, and new developments in science and technology are promptly introduced to make the teaching content modern and timely. In cooperation with the work of the Mengcao Museum, the resource nursery of the National Long-term Positioning Station for Grassland, the scientific research conducted by the team teachers and social service activities, relevant cases are collected and recorded to dynamically update the ideological and political case library.

4.2 Strengthening Smart Ideological and Political Education in the Construction of Smart Courses

The course will organise the essence of ideological values and spiritual and cultural connotations in the professional knowledge system in an orderly manner. A Knowledge Graph is employed to locate knowledge precisely and present its structure and visuals. In addition, all parts of the smart-classroom teaching in this course have also been strengthened by integrating new ideological and political content to achieve close connection and dynamic integration of ideological and political materials with the knowledge graph.

Fund Projects

2024 Jilin Province Higher Education Teaching Reform Research Project (2024L5L3GWG002R).

2025 Course Ideological and Political Teaching Reform Research in Higher Agricultural and Forestry Institutions (nllm202565).

References

- [1] Zhou T. R., Zhang P. Q., Xiao Y. Z., et al. Ideological and political construction of the core course of Grassland Science: Taking the course of Processing and Storage of Forage and Feed Crops as an example. *Grassland and Prataculture*, 2026, 38(1): 40-44.
- [2] Yang J., Wang Y. X., Hu Z. X., et al. Analysis on the ideological and political teaching reform of the course of Breeding of Grass Plants under the background of New Agricultural Science. *Journal of Smart Agriculture*, 2026, 6(1): 189-192.
- [3] Bai J., Fan Q. S., Zhao Y. J., et al. Innovative path of ideological and political education in the course of Forage Products driven by industry-education integration: Construction and practice of the "trinity" education model. *Pratacultural Science*, 2025, 42(11): 2965-2974.
- [4] Liu Y. J., Hu X. W., Han Y. H. Ideological and political construction and implementation of the course of Seed Science of Grass Plants under the concept of OBE. *Journal of Anhui Agricultural Sciences*, 2025, 53(1): 260-264+270.
- [5] Kou J. C., Liu J. H. Exploration and practice of ideological and political education in the course of Grassland Science: Taking the course of "Grassland Resources and Management" as an example. *Grassland and Prataculture*, 2024, 36(2): 34-38.
- [6] Chen S. M., Song Z. F. Analysis on the integration of ideological and political education into practical teaching: Taking Grassland Science major as an example. *The Science Education Article Collects*, 2024, (10): 65-68.
- [7] Xiong W. D., Ma L. C., Zhang K., et al. Exploration of ideological and political education in the teaching of Grassland Science. *Journal of Anhui Agricultural Sciences*, 2022, 50(4): 275-277.