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Exploration and Reflection on Ideological and Political Elements in the Teaching Reform of Smart Agriculture Major

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Abstract: Smart agriculture is playing an increasingly important role in the contemporary higher education system. By deeply integrating ideological[1] and political elements into the teaching reform of smart agriculture, it can not only enhance students' understanding and application of professional knowledge, but also help them establish correct values and social responsibility. This paper, in light of the industry characteristics of smart agriculture and the problems existing in current teaching practice, explores the ideas and specific implementation paths for the exploration of ideological and political[2] elements in the teaching reform of smart agriculture. Through the combination of theory and practice, improvement strategies are proposed in terms of teaching content, teaching methods, teacher training and evaluation mechanisms, with the aim of providing feasible paths for promoting the improvement of the quality of talent cultivation in the smart agriculture major and the cultivation of students' comprehensive qualities.

Keywords: Smart agriculture; Professional teaching reform; Ideological and political elements; Talent development; Overall quality

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1. Introduction

Smart agriculture is an emerging discipline that uses modern information technology, big data, Internet of Things, and artificial intelligence to optimize and enhance the entire process of agricultural production, operation, and management. With the accelerating process of agricultural modernization in China, the importance of smart agriculture has become increasingly prominent and is regarded as a key direction for advancing the structural reform on the agricultural supply side, implementing the rural revitalization strategy and ensuring food security. However, merely cultivating students' professional skills at the technical level is difficult to meet the comprehensive requirements of the country and society for agricultural talents in the new era. If ideological and politicalelements are deeply explored and ingeniously integrated into professional teaching, it will help students, while mastering professional knowledge, enhance their sense of patriotism, cultivate a sense of responsibility and innovative spirit, and lay a solid ideological and moral foundation for serving the cause of agriculture, rural areas and farmers and achieving high-quality agricultural development.

2. The background and significance of teaching reform in Smart Agriculture

The birth of the Smart Agriculture major is closely related to the national modern agricultural development strategy. In the later part of the 21st century, China continues to introduce advanced information technology in the agricultural field, striving to build a new agricultural model that is data-driven, technology-aggregated, and management-efficient. Smart agriculture is not only a recasting and optimization upgrade of traditional agriculture. It is a systematic transformation of production models, business forms and management concepts. The reform of professional teaching should conform to this trend of technological change and reflect the core requirement of "moral education" for talent cultivation in colleges and universities in the new era, enabling students to have the ability and valuesof sustainable development at the stage of mastering professional knowledge.

In such an environment, the incorporation of ideological and political elements becomes quite crucial[3-5]. By guiding students to recognize the important position and social responsibility of agriculture and helping them establish a value orientation of being down-to-earth, dedicated to the community and giving back to the country, it can effectively enhance students' sense of mission and responsibility for smart agriculture, and through comprehensive arrangement and reasonable layout, Let students spontaneously generate thoughts on agricultural ecological civilization and rural revitalization during experimental training, project research, and social practice, thereby consciously aligning their personal career development with the needs of national development and taking bold steps from "learning about agriculture" to "loving agriculture" and "revitalizing agriculture".

3. Exploration and Integration of ideological and political Elements in the classroom teaching of Smart Agriculture major

3.1. Reorganization of teaching content and precise mining of ideological and political materials

In the stage of arranging and upgrading the curriculum of the smart agriculture major, traditional disciplinary knowledge should be reasonably combined with the demands of contemporary social development to achieve the cultivation of students' sense of social responsibility, political identity and patriotism, teachers should select cases when compiling teaching materials, Efforts should be made to explore the intrinsic coupling between macro policies such as national strategies, rural revitalization, and ecological civilization construction and technological innovation. For example, in the teaching of the course "Agricultural Machinery and Automation", the history of agricultural science and technology in Xinjiang Production and Construction Corps can be introduced, from the reclamation soldiers' use of Kantuman for land reclamation in the 1950s to the contemporary Corps' Beidou navigation unmanned seeders, Compare and analyze the dual leaps in productivity and national defense capabilities of agricultural machinery automation, select advanced agricultural technologies that are transformative for The Times to drive the leapfrog progress of agricultural development.

At the same time, vivid examples such as advanced agricultural technologies driving new leaps in poverty alleviation in remote areas and young scientific and technological workers practicing the concept of innovation and entrepreneurship on the front line of rural areas will help students truly understand the importance of agriculture in the overall national layout and form a more thorough understanding of the development concepts of "smart" and "green". In addition, ideological and political elements should be embedded in the logical structureof professional knowledge points, and closed discussions should be conducted on themes such as "harmony between man and nature" and "green and efficient agriculture", allowing students to understand the technical principles while grasping the connection between personal growth and social expectations, and using multi-dimensional and multi-channel material selection and curriculum reshaping, Knowledge imparting and values education in the smart agriculture major can achieve deep integration and interaction, and co-growth, guiding students to build a solid sense of mission and responsibility[6].

3.2. Innovation in teaching methods and activation of ideological and political education

During the implementation stage of smart agriculture professional classrooms, innovative teaching forms are an important

way[7-8] to arouse students' learning motivation and ideological and political identification. Different from the traditional cramming model, teachers are more closely adopting project-based teaching, interactive discussion and real-life simulation methods to create an inquiry atmosphere where teachers and students study together, such as through scenario simulation teaching,[9-11] Students are arranged to undertake simulation or practical topics such as "Digital farm management" and "pest and disease monitoring system" in groups. Through the stage of investigation and demand exploration, through the process of technical implementation to the stage of result evaluation, they gradually appreciate the practical value that smart agriculture brings to society and farmers. Teachers can incorporate ideological and political topics [12]such as rural revitalization and ecological protection into the project, guiding students to pay attention to the balance between economic interests and social welfare, using role imitation and situational teaching to prompt students to switch roles in the identity transformation of developers and users, truly experience perspectives from different positions, from the understanding of professional knowledge and the significance of agricultural science and technology application, Integrating ideological and political elements[13], conducting real-time negotiations through online platforms, using big data analysis tools to simulate decision-making situations, and developing online resource libraries for students' self-study and communication can enhance professional skills and gradually guide them to effectively connect professional learning with the needs of social development. Through these diverse and flexible teaching methods, students can not only learn the core points of smart agriculture, It can further enhance the sense of identity with national development and people's well-being, and truly achieve "the combination of learning and thinking, knowledge and action".

3.3. Training of the teaching staff and improvement of ideological and political literacy

The ideological and political qualities and teaching abilities of teachers themselves are of great significance in integrating ideological and political elements[14] into the teaching of smart agriculture. College teachers should conduct regular training or seminars for smart agriculture teachers to enable them to have a thorough understanding of the essence of the Party's rural work policy, the national agricultural strategy, and policies related to agriculture, rural areas and farmers. To ensure that teachers have a reasonable and appropriate ability to interpret policies and a sense of value guidance, emphasis should be placed on interdisciplinary communication and cooperation, and it is advocated that professional teachers carry out joint lesson preparation or joint research with experts in fields such as the School of Marxism, public administration, and sociology, to avoid focusing only on technical instruction while neglecting the transmission of social values.

With this cross-disciplinary collaboration, teachers can examine the ideological and political opportunities[15] contained in smart agriculture teaching from a broader perspective and present more comprehensive and multi-dimensional content in the curriculum. Additionally, schools need to establish a comprehensive teacher incentive mechanism and incorporate the effectiveness of "ideological and political integration" into categories such as performance assessment and professional title evaluation. Teachers who have made significant contributions to ideological and political education in the curriculum should be commended and given priority resource allocation plans. Individual teachers also need to enhance their understanding of the actual needs of agriculture and the process of rural revitalization through self-study, academic interaction, engagement in social affairs, etc., and truly transform the sense of patriotism and social mission into the driving force foundation of their own teaching, so as to more effectively guide students to master "knowing agriculture, loving agriculture, and serving agriculture" in professional learning and cultivate "agriculture, rural areas and farmers" talents.

3.4. The design of practical links and the cultivation of social responsibility

The smart agriculture major has obvious application effects and practical significance, and the cultivation of social responsibility also requires diverse real-world experiences. Therefore, the practical links should be made into the main platform for students to carry out ideological and political education. First, in the context of industry-education integration and school-enterprise cooperation, teachers can take the lead in establishing cooperation with smart agriculture enterprises and research institutions, Drive students to integrate into the actual production or research and development stage to understand the value and entanglepoints of agricultural science and technology from actual needs and actual cases, and rely

on the active collaboration between universities and rural grassroots organizations to carry out "science and technology to the countryside" activities to assist farmers in implementing precise sowing, sensor deployment and big data technology training, which can effectively enhance students' practical operation skills, Third, through first-hand experience, students can understand the value of people's livelihood needs and social services through close interaction with farmers. For example, work with government departments to pre-build agricultural informatization plans, explore agricultural non-point source pollution control, etc., embed personal professional capabilities into the broader context of national and social development. Fourth, vigorously promote the establishment of smart agriculture innovation laboratories or student associations on campus, guide student groups to conduct open research or innovation and entrepreneurship attempts, and appropriately handle real-world problems with the knowledge they have learned. Create a virtuous cycle of "combining learning with application and promoting learning through application". Through the above-mentioned multi-category and multi-stage practice design, students will fully master advanced technologies in the field of smart agriculture, and gradually develop a sincere sense of social responsibility and service awareness. Thus, in the future career path and life process, they will become comprehensive talents with technical expertise, lofty aspirations, and concern for agriculture, rural areas and farmers.

4. Guarantee and evaluation Review of ideological and political teaching reform in Smart Agriculture major

4.1. Integrated design of curriculum system and teaching evaluation

The teaching reform of smart agriculture should start with the design of the curriculum system to ensure the effective integration of ideological and political elements with professional knowledge. The curriculum system needs to be planned from a comprehensive perspective, clarifying the ideological and political orientation of the curriculum setting, teaching objectives and content structure. The core requirements of ideological and political education should be fully reflected in the curriculum design. Align the core socialist values, the national agricultural strategy, the green development concept and other spiritual essentials with the content of professional courses. For example, during the teaching implementation period, the curriculum should not only teach agricultural technology but also guide students to think about how agricultural science and technology can serve society and promote rural revitalization. The teaching evaluation system should focus on diversity. In addition to conducting professional skills assessment for students, social responsibility, teamwork ability, and innovative spirit should also be included in the evaluation dimensions. By associating ideological and political literacy with academic performance, guiding students to understand the integration of social responsibility and personal mission in practical links, and guiding students to apply knowledge to social service situations, the comprehensive arrangement of the curriculum system and assessment standards is sufficient to promote the all-round development of students at the fundamental level and achieve the dual goals[4] of ideological and political education and professional skills building.

4.2. Integration of industry and social resources and collaborative education

The reform of ideological and political education in the smart agriculture major is not only focused on the internal optimization of the curriculum, but also requires the integration of industry and social resources and the realization of the transformation rate of collaborative education results through models such as school-enterprise cooperation and industry-university-research integration. Schools can establish long-term cooperation with agricultural technology enterprises and smart agriculture projects to carry out collaborative development of courses and joint design of projects. Break down the threshold between teaching and practical work, allowing students to experience advanced agricultural technology in the actual production process of enterprises and understand the social responsibility of enterprises. Schools can work with local governments and rural areas, through social practice, science popularization demonstration services and other activities, to cultivate the social dedication and patriotism of agricultural science students. By introducing industry resources, students can not only acquire cutting-edge agricultural technology, but also, through practical exercises, understand the profound

impact of technology application on society, economy and environment, The collaborative education model is conducive to fostering students' innovative consciousness, social service consciousness and sense of responsibility, and cultivating compound and innovative professionals to support rural revitalization and agricultural modernization.

4.3. Construction of teacher incentive mechanisms and growth platforms

Teachers play an indispensable role in the reform of ideological and political teaching in smart agriculture. Therefore, it is necessary to establish appropriate teacher incentive mechanisms and growth platforms. Schools should introduce incentive measures, incorporate teachers' achievements in ideological and political teaching in courses into assessment elements, and give praise and rewards to teachers who have made outstanding contributions. It covers channel preferences in areas such as professional title evaluation, job promotion, and research projects. Schools should provide teachers with abundant career development opportunities by conducting regular teaching seminars, academic exchanges, teacher training activities, etc., to enhance teachers' ideological and political levels and professional skills, help teachers build more efficient teaching concepts, and also build platforms for teachers' growth, support teachers' participation in interdisciplinary teamwork, off-campus training base construction, scientific research projects, etc. To broaden teachers' academic insights and practical accumulation, the dual role of incentive mechanisms and growth platforms can not only enhance teachers' teaching quality and research level, but also encourage them to implement ideological and political teaching concepts more fairly, incorporate ideological and political elements appropriately into professional courses, and improve the overall level of education.

4.4. Sustainable output of teaching research and academic achievements

During the intervention stage of ideological and political teaching reform in smart agriculture, the continuous output of teaching research and academic achievements is the driving force for reform and progress. Schools should advocate that teachers conduct research on the integration of ideological and political education with professional courses and explore innovative practices in areas such as teaching content, methods, and evaluation. By means of subject exchanges, group discussions, research projects, case analyses, course development, etc., extendable teaching measures and academic achievements are formed to support the full integration of ideological and political education in professional teaching. Teaching research results should be disseminated and shared in various forms such as academic conferences, journal articles, and textbook compilations to promote the application of theoretical innovation and practical experience in ideological and political teaching of smart agriculture in a broader educational field. Furthermore, schools should establish a long-term system for teaching research, such as implementing special projects and establishing educational reform research centers, etc. Provide research support for teachers and ensure that there is an endless supply of academic resources for teaching reform.

5. Conclusion

Integrating ideological and political elements into the teaching reform of smart agriculture is an inevitable choice for talent cultivation in colleges and universities in the new era. Through the reshaping of curriculum content, the innovation of teaching methods, the strengthening of teacher training, and the construction of a diversified evaluation mechanism, the two-way integration of smart agriculture professional knowledge and ideological and political education can be achieved. In the process of learning advanced technologies and industry knowledge, students will have a deeper understanding of the significance of agriculture to national development and social well-being, thus cultivating comprehensive talents with solid professional foundations, patriotic sentiments, and a sense of "agriculture, rural areas and farmers" and social responsibility. Only through multi-party collaboration, continuous promotion of teaching reform and continuous deepening of ideological and political construction can we reserve a continuous supply of reserve forces for the transformation and modernization of China's agriculture, and can we truly build smart agriculture into an important growth pole and an

important engine of social progress in the new era.

Disclosure statement

The author declares no conflict of interest.

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