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Research on the Empowerment of Digital Intelligence in the Cultivation Model of Innovative Talents in New Agricultural Sciences in Higher Education Institutions

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Abstract: In order to meet the needs of new agricultural science construction in the era of digital intelligence, this paper focuses on how to deeply integrate digital intelligence innovation literacy and practical ability in the cultivation of agriculture-related talents in colleges and universities, and discusses the construction content, construction ideas and methods and specific innovation points of the cultivation mode of innovative talents in new agricultural science enabled by digital intelligence. It introduces in detail the information technology curriculum system for the development of new agricultural science constructed in accordance with the idea of "progressive integration of general and specialized," and the diversified practical teaching mode combining the teaching mode of integrating science and practice with the teaching mode of promoting the development of numerical intelligence literacy and ability with the course practice, discipline competition, scientific innovation project and graduation design. The training mode of new agricultural talents empowered by mathematical intelligence education and teaching is worthy of further promotion in other agriculture-related colleges and universities.

Keywords: Digital intelligence; New agricultural science; Innovation literacy; Curriculum system; Teaching mode

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1. Introduction

The transformation of digital intelligence to promote the improvement of agricultural new quality productivity has become a key force to promote China's future agricultural development and rural revitalization, in which the training of innovative talents in new agricultural science plays a key role [1,2]. The core of agricultural new quality productivity is to take scientific and technological innovation as the driving force and digital intelligent development as the means to get rid of the traditional agricultural growth mode, with the characteristics of high technology, high efficiency and high quality [3].

The key to building agricultural power is to cultivate new agricultural innovative talents with digital innovation literacy and practical ability through higher education to cope with various complex challenges in agricultural production and scientific and technological innovation, and promote agricultural digital intelligence and sustainable development [4]. For agriculture-related colleges and universities under the background of new agricultural construction, it is necessary to actively utilize information technology education, especially emerging information technology education such as the Internet of Things, artificial intelligence, cloud computing, and big data, and explore the integration of general education of information technology and agriculture-related professional education [5]. Ways to deeply integrate digital intelligence innovation literacy and practical ability in the cultivation of agriculture-related talents, and cultivate innovative talents for the development needs of new agricultural sciences has become an important mission of education and teaching in higher agriculture-related schools in the new era [6].

2. The main construction content of the training mode of new agricultural innovative talents in colleges and universities empowered by digital intelligence

The focus of training new agricultural innovative talents in colleges and universities is to deeply integrate digital intelligent innovation literacy and practical ability, explore innovative talent training modes that meet the development needs of new agricultural science [7,8], and inject new energy into the training of new agricultural science talents with digital intelligent education and teaching. The main construction contents mainly include the following aspects:

(1) The construction of the curriculum system for the cultivation of digital intelligent innovation literacy and practical ability

In view of the difference between the professional categories of agriculture-related subjects and the level of students' development needs under the background of new agricultural science, the information technology curriculum system with the gradual and deep cross-integration of general education and professional education should be built, so that students can gradually master the information technology knowledge system and operational skills, and cultivate students' interdisciplinary digital intelligent innovation literacy and practical ability.

(2) The construction of course teaching mode for cultivating digital intelligent innovation literacy and practical ability

Combining theoretical teaching with experimental teaching, students' online self-study and teachers' classroom teaching and other teaching modes through digitalized teaching media and platforms, and flexibly and appropriately integrating ideological and political elements into the course teaching process and applying digitalized teaching platform, imparts students' digitalize information technology knowledge and improves students' digitalize information operation skills. To stimulate and cultivate students' digitalization innovation literacy and practical ability.

(3) The construction of a practical teaching model oriented to the cultivation of mathematical intelligent innovation literacy and practical ability [9,10]

Reasonable and effective mobilization of students' enthusiasm, through the basic, professional, comprehensive and innovative types of experimental courses and digital intelligent knowledge and application skills competitions, scientific innovation projects, industry-university-research projects and

graduation design and other types of practical teaching activities combined with students' professional knowledge, gradually improve students' number intelligent innovation literacy and practical ability.

3. Ideas and methods for the construction of new agricultural innovative talent training modes in colleges and universities empowered by digital intelligence

3.1. Information technology curriculum system for the cultivation of digital intelligent innovation literacy and practical ability

In terms of the construction of the curriculum system for the cultivation of the practical literacy and ability of the number intelligent innovation, the information technology curriculum system for the development of new agricultural science is constructed according to the idea of "progressive integration of general and specialized" (**Figure 1**):

(1) College IT and College Programming Python/C required courses for non-IT freshmen that offer college Computer CAP electives and sub-subject instruction.

(2) Introduction to Artificial Intelligence, Machine Learning, Application of Artificial Intelligence and other compulsory courses, Deep Learning and other elective courses for artificial intelligence minor majors; Optional courses such as Introduction to Artificial Intelligence and Python Data Processing are offered for other majors.

(3) Undergraduate degree graduation project/thesis [11] based on digital intelligentization technology designed for senior students.

By learning the basic theoretical knowledge of information technology and typical application cases and carrying out relevant application practice activities, we can meet the needs of multi-level talent training goals, promote cross-professional learning, gradually improve students' practical literacy and ability of digital intelligent innovation, and promote the cultivation of innovative talents in new agricultural science.

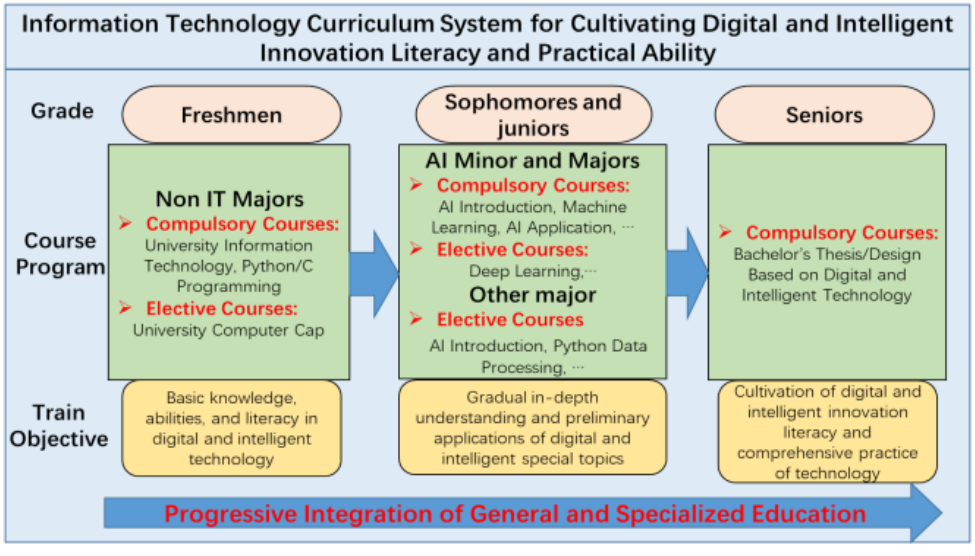

Figure 1. Information technology curriculum system for the cultivation of digital intelligent innovation literacy and practical ability.

3.2. The integrated teaching mode of science and practice for the cultivation of digital intelligent innovation literacy and practical ability

In terms of the construction of the course teaching mode oriented to the cultivation of numerically intelligent innovation literacy and practical ability (**Figure 2**):

(1) Comprehensively implement the "integration of theory and practice" teaching mode [12] in general, help students understand, master and apply theoretical knowledge, cultivate the style of combining theory with practice, rigorous and realistic scientific attitude, independent hands-on ability, develop the ability of observation, thinking and innovative design, and enhance students' sense of social responsibility.

(2) In terms of theoretical teaching, it actively carries out the "mixed teaching" mode, which combines "online independent learning" and "offline classroom teaching". Online learning pays more attention to the systematic and comprehensive explanation of basic theoretical knowledge, while offline teaching is intensive and refined, and focuses more on the internalization and promotion of knowledge.

(3) In experimental teaching, the teaching mode of "three-stage teaching" consisting of "basic practice," "comprehensive design" and "research and exploration" is actively carried out. Basic exercises undertake cognitive tasks at the level of understanding and understanding, cultivate students' basic cognitive ability, and require students to master basic experimental methods and operational skills. Comprehensive design undertakes cognitive tasks at the application and comprehensive levels, and cultivates students' thinking mode of comprehensive consideration, independent learning, independent exploration, and comprehensive application of knowledge to solve problems [13]. Research and exploration undertake cognitive tasks at the research level, stimulate students' desire for innovation, and cultivate students' interest in scientific research and research innovation ability.

At the same time, in terms of the implementation of the teaching mode, we actively explore the teaching method of "promoting numerically intelligent innovation literacy and practical ability by using numerically intelligent tools," combining the student portrait, academic warning, knowledge graph, problem graph and intelligent teaching assistant on the online teaching platform to promote the improvement of students' numerically intelligent innovation literacy and practical ability.

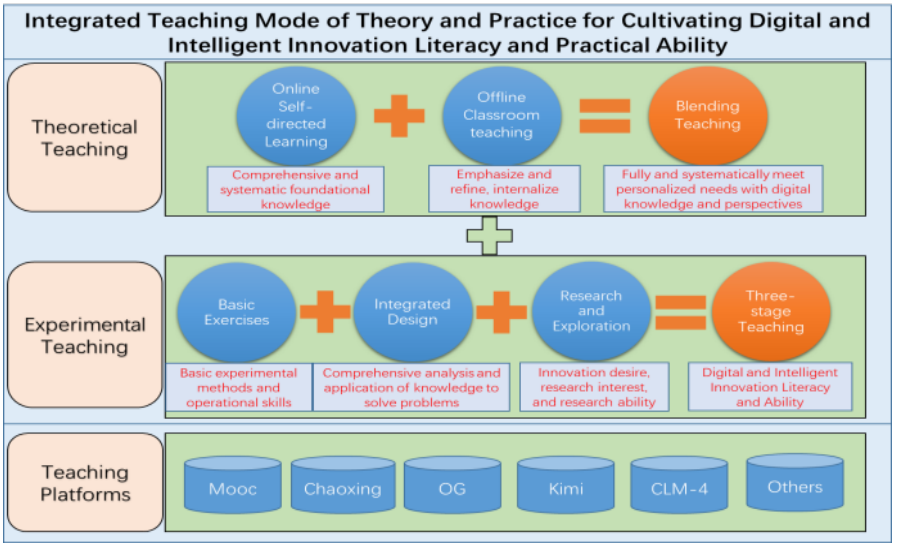

Figure 2. Course teaching mode for the cultivation of mathematical intelligence innovation literacy and practical ability.

3.3. Diversified practical teaching mode oriented to the cultivation of digital intelligent innovation literacy and practical ability

In terms of the construction of a practical teaching model oriented to the cultivation of digitalized innovation literacy and practical ability (**Figure 3**):

(1) In general, in accordance with the diversified mode, students can gradually cultivate and improve their digital intelligence innovation literacy and practical ability from four aspects: guiding students to complete the experimental courses of theory courses [14], participating in extracurricular competitions and scientific research projects, and completing the graduation project.

(2) Designed basic, professional, comprehensive and innovative experiments to master basic experimental skills, professional experimental skills, comprehensive design skills and applied innovation skills for theoretical experimental courses, formed a progressive innovative practice teaching system, and gradually improved students' innovative literacy and practical ability of numerical intelligence.

(3) In addition to experimental courses, actively explore the "learning through competition" and "project-driven" teaching modes, set up competitions in information skills-related courses to stimulate students' interest in learning, select and guide a group of outstanding students to participate in various competitions such as China Computer Design Competition, Blue Bridge Cup Competition, Internet + Competition, ACM Competition, etc. Participate in curriculum practice, college students science and technology innovation projects, enterprise practical training projects, tutor research projects and other topics, using the project as the carrier, effectively play the integration of production and education, science and education integration and industry-university-research collaborative education functions.

(4) According to the idea of interdisciplinary integration, focus on the big data analysis, digitalization and intelligent application of agriculture-related majors and the research needs of agricultural machinery and equipment, put forward the solution of data intelligence problems, and jointly guide the students to complete the graduation thesis/design with the teachers of agriculture-related majors.

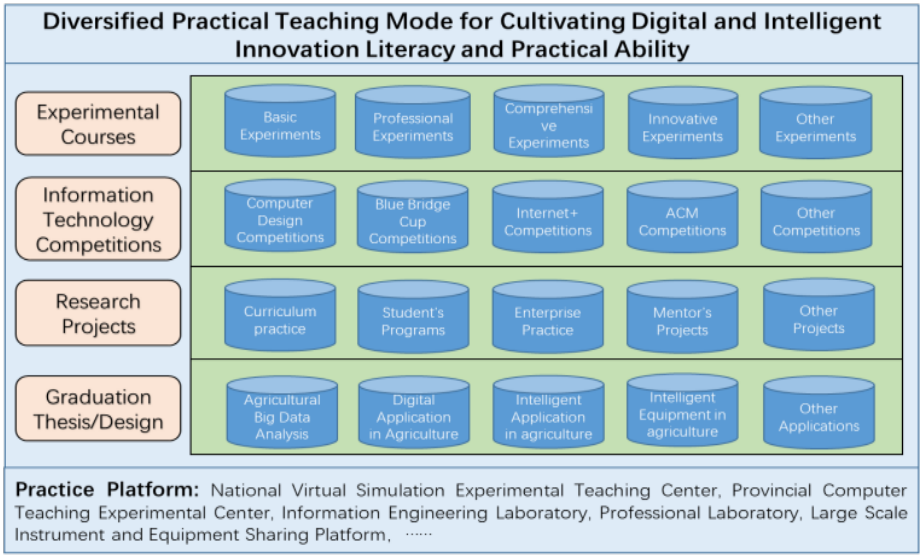

Figure 3. Practical teaching model for the cultivation of digitalization innovation literacy and practical ability.

4. Innovation points

It is a long-term task and systematic project to cultivate the digital intelligence quality and practical ability of innovative talents in new agricultural science, involving many aspects such as discipline, education and teaching. We must adhere to the systematic concept and multi-dimensional efforts to build a new agricultural talent training model that conforms to the law of talent growth, education, teaching and scientific and technological innovation. The innovation points of the model in this paper mainly include:

(1) The information technology curriculum system of "progressive general and specialized integration" is constructed in light of the construction demand of innovative talents in new agricultural science, focusing on the cultivation of digital intelligence innovation literacy and practical ability. Given the differences in the professional categories of agriculture-related subjects and the needs of students' development levels, it enables students to transition and integrate from easy to difficult, from general education to professional education, and gradually master the information technology knowledge system that meets the professional development.

(2) The information technology course for the cultivation of digitalization innovation literacy and practical ability actively explores the teaching mode of integrating science and practice and promoting digitalization literacy and ability with digitalization [15]. Through the teaching media and platform of numerical intelligence, combining theoretical teaching with experimental teaching, students' numerical intelligence information operation skills are improved, and students' numerical intelligence innovation literacy and practical ability are cultivated.

(3) For the cultivation of digital intelligent innovation literacy and practical ability of innovative talents in new agricultural sciences, it actively explores a diversified practical teaching mode combining experimental classes, competitions, projects and graduation projects. The establishment of interdisciplinary projects and graduation projects proposes to promote the germination, cultivation, expansion and practice of innovative practical ability according to the training needs of differentiated talents, and actively carry out practical education.

5. Conclusion

This paper discusses the main content and concrete ideas and methods of the construction of new agricultural innovation talent training mode in colleges and universities empowered by digital intelligence, including the construction of curriculum system, teaching mode, and practice mode. Focusing on the cultivation of digital intelligent innovation literacy and practical ability, the paper systematically constructs a progressive and integrated information technology curriculum system, a curriculum teaching model integrating science and practice and a diversified practical teaching model, which provides a reference model for the cultivation of innovative talents in agricultural colleges and universities.

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Disclosure statement

The authors declare no conflict of interest.

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