

Research on the Training Model of Top Innovative and Entrepreneurial Talents in Economic Statistics under the Background of "AI+"

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Abstract: On the basis of combing the research results of traditional mode and "AI+" enabling education, this paper points out that there are some problems such as the lack of students' ability to innovate and apply, the loose combination of data modeling and actual decision-making, and the limited intelligent penetration of the curriculum system. Furthermore, this paper proposes a "four-stage and three-step" progressive training system of "knowledge-data and skills-intelligent and application-innovation ability", explores the dual mode of "AI-assisted competition-Practice Courses" and "AI-driven projects-school enterprise alliance", and promotes the collaborative improvement of students' professional cognition, interdisciplinary integration and innovation and entrepreneurship ability. This model can effectively break the limitations of the traditional application-oriented talent training path, and provide experience for the economic statistics major to explore the new paradigm of "AI-empowerment-innovation and entrepreneurship driven" top-notch talent training.

Keywords: "AI+"; Economic Statistics; Top-Notch Talent Training; Innovation and Entrepreneurship

1. Introduction

The National Conference on the Promotion of Strategic Actions for Cultivating Top Talents in Basic Disciplines, held in July 2024, emphasized the need to adhere to the overall requirements of building a strong nation through education, address national strategic needs, and thoroughly grasp the opportunities and challenges presented by new technologies such as artificial intelligence. Accelerate the

strategic action of cultivating top talents and provide strong support for building a world-leading talent center and innovation hub. The "Top Talents Program for Cultivating Top Students in Basic Disciplines" (hereinafter referred to as the "Top Talents Program") has established 288 training bases at 77 high-level research universities, attracting over 30,000 outstanding students to pursue studies in basic disciplines. In 2018, the Ministry of Education and six other departments jointly issued the "Opinions on the Implementation of the 2.0 Top Talents Program for Cultivating Top Students in Basic Disciplines," further expanding the scope, increasing the number of students, improving the quality, and innovating the Program. In the new era of rapid development of "artificial intelligence plus" and generative artificial intelligence (AIGC), cultivating top talents faces new challenges and opportunities. How to innovate models for cultivating top innovative and entrepreneurial talents in economics and statistics, empowered by AI, and build a talent cultivation system that better meets the needs of the times has become a critical topic that urgently requires in-depth research.

2. Literature Review

At present, many scholars have conducted in-depth research on the cultivation mode of innovative and entrepreneurial talents in liberal arts majors.

Regarding traditional models for cultivating innovative and entrepreneurial talent in economic statistics, most research focuses on enhancing the innovation and entrepreneurial capabilities of economic statistics students within the traditional educational framework through curriculum integration, practical teaching, and optimization of evaluation mechanisms. Zhu, explored methods for

introducing statistical software (such as R and Python) and data visualization into economic statistics courses, proposing a combination of data-driven and case-based teaching to enhance students' comprehensive competencies: statistical thinking, software skills, and practical abilities[1]. Wang and Cai proposed a "five-in-one" innovation and entrepreneurship education model, emphasizing the collaborative efforts of universities, students, government, platforms, and intermediary institutions to jointly promote the cultivation of top-notch innovative and entrepreneurial talent[2]. Li, analyzed the reform of economic statistics courses in universities from the perspective of "dual entrepreneurship education." He proposed adding an "innovation practice module" to the basic curriculum, introducing real economic data, entrepreneurial cases, and project research, and constructing a three-level curriculum structure: "theoretical teaching - project training - entrepreneurial guidance"[3]. Wang and Zhang studied the role of school-enterprise collaboration in promoting innovation and entrepreneurship education. Through co-construction of experimental platforms and joint guidance, students participate in real-world enterprise research and data analysis projects, with mentors from the enterprise and on-campus faculty providing guidance throughout the entire process, from survey design to statistical report writing [4]. Liu, analyzed the limitations of the evaluation system in traditional experimental teaching, noting that "a single final assessment fails to reflect the innovation process". She suggested a hybrid approach combining process-based evaluation with project outcome presentations, focusing on the "discovery-design-practice-feedback" learning process as a key evaluation step [5]. Guangming Daily, summarized the "one body, two wings" dual innovation education model developed by a certain university. This model, based on the "curriculum-practice-evaluation" system and supported by "innovation through competition" and "innovation through the campus, "aims to enhance students' innovative awareness and practical skills [6]. Ye, proposed a "specialization-innovation integration" model, emphasizing the in-depth integration

of professional education with innovation and entrepreneurship education under demand-driven principles, building a holistic framework encompassing training objectives, curriculum, teaching resources, practical teaching, and evaluation mechanisms[7]. Regarding the cultivation model for top-notch innovative and entrepreneurial talent from the perspective of "AI+," Wu, proposed, based on the practical path of "AI+" in the field of innovation and entrepreneurship education, a dynamic curriculum iteration mechanism, a virtual-reality integrated practice platform, and a collaborative training system integrating industry and education. He also verified the improvement of students' case analysis skills and technical ethics critical thinking abilities through teaching reform[8]. Xu, proposed a path of "digital intelligence empowering the high-quality development of innovation and entrepreneurship education," advocating the construction of an innovation and entrepreneurship education ecosystem characterized by "digital intelligence technology empowerment—data-driven—scenario integration—value symbiosis," to promote universities in cultivating top-notch talent with data-driven decision-making capabilities, cross-disciplinary integration capabilities, and continuous innovation capabilities[9]. Yi, (2024) concluded that AI has broken through the limitations of traditional innovation and entrepreneurship education models through intelligent teaching, capacity training, and assessment [10]. Han, (2024) pointed out that the rise of artificial intelligence technology is driving innovation in the theoretical and practical design of innovation and entrepreneurship education in universities. Universities should apply AI to support teaching management, curriculum resource development, teaching evaluation, and project incubation. Through intelligent timetable management, academic reminders, intelligent recommendation systems, and knowledge graph technology, they can provide intelligent tools and new paths for innovation and entrepreneurship education [11]. Ma and Wang proposed that the logic of innovation and entrepreneurship education should be reflected in the transformation of training objectives to high-level literacy, the promotion of

interdisciplinary integration in the curriculum system, the urgent need to build an integrated ecosystem of industry, academia, and research, and the creation of a teaching space that "combines human-machine collaboration and virtual reality" and the development of process-oriented and growth-oriented innovation and entrepreneurship evaluation tools[12]. Fan, (2024) pointed out that artificial intelligence can empower innovation and entrepreneurship education in universities, providing intelligent teaching methods and ability assessment mechanisms, but there are still problems such as data barriers, lagging technology updates, and insufficient application scenarios[13].

Under the background of "AI+", there are still multiple bottlenecks in the cultivation of talents majoring in economic statistics: first, the curriculum system is disconnected from the technological frontier. The current curriculum system is still dominated by traditional statistical methods and software applications, and the introduction of new tools such as artificial intelligence and big data analysis is insufficient, resulting in students' lack of data intelligence literacy, which is difficult to meet the needs of intelligent economic management. Students have the phenomenon of "being able to use but not create" in the application of big data and intelligent analysis tools, and lack the ability of independent modeling and innovative application; Second, the penetration of innovation and entrepreneurship education is insufficient. The teaching link is more at the level of case explanation and experimental operation, lacking in-depth integration with the real scene of the enterprise. Students' innovative thinking, entrepreneurial awareness and interdisciplinary application ability have not been effectively cultivated. The combination of data modeling and actual decision scenarios is insufficient, and the comprehensive application ability of interdisciplinary knowledge is weak; Third, the evaluation system is single, which is difficult to stimulate the growth of top-notch talents. The existing assessment focuses on knowledge acquisition and skill training, ignoring students' comprehensive practical ability and innovation and entrepreneurship

achievements. The lack of a scientific and reasonable "intelligent-multi-dimensional" evaluation system restricts the growth of top-notch talents. The curriculum system still emphasizes theory teaching, and the penetration of artificial intelligence technology is insufficient, which leads to the limited improvement of students' practical ability and innovation ability. In view of the above problems, this paper focuses on "AI-statistics" and "AI-Courses", and explores the construction of intelligent teaching platform, data-driven experimental practice system and innovation incentive mechanism.

3. "AI+" Economic Statistics Major: Training Model for Top-Notch Innovative and Entrepreneurial Talents

With the core concepts of "AI empowerment, interdisciplinary integration, and innovation-driven development," and adhering to a "two-pronged" teaching design approach—aligning technology application with professional training objectives, and intelligent tools with the curriculum—this program achieves a four-stage, three-step progressive development goal of "knowledge-data" and "skills-intelligent application-innovation." The first stage focuses on improving students' foundational competence in economics and statistics; the second stage incorporates AI tools to conduct socioeconomic research and data collection; the third stage strengthens analytical and decision-making skills based on big data and machine learning; and the fourth stage focuses on cultivating innovative and entrepreneurial competence driven by intelligence. The program develops a three-dimensional "smart classroom" model. First, leveraging an AI-powered virtual experiment platform and intelligent case library to bring real-world research and competition cases into the classroom, achieving "intelligence-driven learning". Second, through personalized learning and adaptive teaching supported by AI technology, it promotes reforms in the curriculum and teaching methods, achieving "intelligence-driven teaching". Third, leveraging an intelligent industry-education integration platform to promote collaborative innovation, joint R&D, and entrepreneurial incubation between universities and enterprises, achieving "intelligence-driven entrepreneurship". "At the same time, a hierarchical capacity-

building system will be established. Empowered by artificial intelligence, students' intelligent cognitive abilities, interdisciplinary collaboration capabilities, complex data application capabilities, and intelligent innovation and entrepreneurship capabilities will be cultivated in stages, promoting an overall upgrade in the training model for top innovative and entrepreneurial talents in the economic statistics major.

3.1 Constructing a Curriculum System that "Uses AI to Promote Learning and Teaching"

On the one hand, in the curriculum system, the teaching module of "basic AI tools-data intelligent analysis-Intelligent Decision Support-innovation and entrepreneurship practice" is set up in four stages to form a hierarchical training chain from cognition to application and then to innovation; In terms of teaching mode, make full use of intelligent learning platform, virtual simulation laboratory and AI case library to transform subject competitions and real cases of enterprises into teaching resources, and realize "promoting learning and teaching with AI"; In terms of school enterprise cooperation, promote "school enterprise joint construction-smart industry practice", provide AI application scenarios and training bases by enterprises, jointly carry out project research, curriculum development and discipline competition training, and promote the in-depth connection between talent training and job requirements. According to the three-level structure of "basic courses-core courses-expansion Courses", artificial intelligence related courses, such as machine learning and statistical analysis, Python and data visualization, and the application of artificial intelligence in economic forecasting, will be gradually introduced to promote the in-depth integration of disciplines.

On the other hand, give full play to the role of AI platform in learning diagnosis, ability evaluation and personalized learning path recommendation; On the other hand, we should form a "pass on, help and lead" mechanism for higher grade students to lower grade students, and combine AI driven learning path guidance to create a cross grade innovative learning community. Through the demonstration of typical teams, interdisciplinary integration projects and intelligent competition, a virtuous

cycle mechanism of "AI empowerment-CO construction of teachers and students-integration of production and education" is built to achieve the gradual improvement of students' cognitive ability, cooperation ability, application ability and innovation and entrepreneurship ability.

3.2 Reconstructing the "AI+" Talent Development Curriculum System and Optimizing the Evaluation and Feedback Mechanism

Introduce AI learning analysis tools, establish a multi-dimensional dynamic evaluation system including knowledge mastery, skill application, team cooperation, innovation and entrepreneurship achievements, and form a comprehensive evaluation mechanism with equal emphasis on "process-result". Build a three-dimensional talent training curriculum system of "innovative quality-artificial intelligence application ability-professional knowledge". By introducing the concept of "ai+" into the classroom, the ternary teaching relationship of "teachers and students-AI tools" is formed, and the traditional single mode centered on Teachers' teaching is broken. In the pre class phase, the teacher transforms the core knowledge and difficulties into AI interactive scripts, guides the students to complete the preview in the simulated dialogue with AI, reduces the learning threshold and cultivates logical thinking; In class, teachers, students and AI participate in case discussion and role play together to promote the integration of knowledge application and innovation ability; After class, students complete task design and answer optimization through AI, and strengthen critical thinking and expression ability. The difficulty lies in how to scientifically construct the "AI-course" framework, and avoid students' excessive dependence on AI through a reasonable evaluation mechanism, so as to truly realize the internalization of knowledge and ability improvement.

3.3 Cultivating an "AI-Competition-Driven" Practice and Innovation Environment and Establishing a Multi-Level Incentive Mechanism

The mode of "AI-subject competition" uses AI to complete data collection and preliminary analysis, helping students focus on research problems faster; In the process of preparing for

the competition and actual combat, the students' five abilities of "learning, practice, innovation, communication and cooperation" are gradually cultivated in combination with school level, national level professional and comprehensive competitions. The difficulty of the research is how to design an effective competition incentive mechanism, which can not only stimulate the enthusiasm of students, but also ensure the collaborative innovation of "AI-people", so as to realize the hierarchical leap from cognitive ability to innovation ability, and build a perfect top-notch innovation and Entrepreneurship Talent Training mode. By introducing intelligent teaching platform and AI tools (such as chatgpt, SAS viya, python AI library, etc.), the experimental course is reconstructed to improve students' data processing and modeling ability. At the same time, relying on the discipline competition, the mathematical modeling competition and data mining competition will be transformed into classroom teaching cases to realize "promoting learning and teaching through competition".

3.4 Build a School Enterprise Internship Practice Platform

The first is to build an off campus practice base in the way of school enterprise integration to meet the actual needs of professional development, build a comprehensive coverage, rich types and mutually supportive practice teaching base system, create a demonstration off campus practice teaching base, and form a demonstration radiation effect inside and outside the school. The second is to build the laboratory in the school by introducing enterprises to the school, organically integrate the industrial elements into the teaching of disciplines and specialties, take into account the curriculum elements and production factors, jointly build the practical education system and productive training base, and create a real working environment for production and technology development. The case analysis data of economic statistics are often stored in the internal server of the company and other conditions. Daily book cases are difficult to meet the learning needs of students. Therefore, it is an effective way to improve the combination of theory and Practice for students to strengthen the contact with cooperative enterprises, build a practical teaching system of "classroom+enterprise+Post" and an enterprise

practice mechanism of "integration of production and education, and resource sharing", and transfer the practice simulation classroom directly to the counterpart cooperative enterprises.

4. Summary

Under the background of AI empowerment, combined with the experience of talent training reform at home and abroad and the characteristics of economic statistics specialty, this paper puts forward the talent training mode of "Curriculum System Reconstruction-Practice Teaching Innovation-deepening the integration of production and Education-intelligent evaluation optimization". Through the in-depth combination of AI tools with classroom teaching, discipline competition and practice, an integrated path of "classroom practice innovation" is formed to promote the collaborative improvement of students' professional cognitive ability, interdisciplinary comprehensive ability and innovation and entrepreneurship ability. At the same time, explore the "AI-assisted competition-Practice Course" mode and the "AI-driven project-school enterprise joint" training mode, providing a new paradigm for the cultivation of top-notch innovative and entrepreneurial talents. Guided by the discipline competition and curriculum practice driven by artificial intelligence, the learning chain of "AI-practice - theory improvement-AI repractice" is reconstructed to break the single logic of traditional "theory practice". We can realize the gradual progress from perceptual cognition to data logic understanding, from skill training to intelligent application, and from cognitive ability to innovation ability. This mode helps to break through the bottleneck of traditional teaching, improve students' data intelligence, interdisciplinary integration and innovation and entrepreneurship ability, and explore a new path for the cultivation of top-notch innovation and entrepreneurship talents. The research results are of great significance for promoting the modernization of economic statistics education and serving the national innovation driven development strategy.

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