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Exploration and Practice of Information and Computing Science Major Construction in Finance and Economics Universities in the context of the digital economy

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ABSTRACT: In the context of big data, combined with the school's financial orientation and the characteristics of information and computing science majors, this paper analyzes the unique exploration and practice of Jiangxi University of Finance and Economics, the only mathematics major—information and computing science majors that teach students in accordance with their aptitudes. It will help to make up for the shortcomings of the development of information and computing science in finance and economics colleges and universities, and provide reference for the characteristic development of information and computing science majors in finance and economics colleges.

KEYWORDS: information and computing science; professional construction; finance and economics universities

I. INTRODUCTION

The Information and Computational Science (ICS) program, established in 1998 by the Ministry of Education, is a new mathematics discipline aimed at cultivating mathematical talents equipped to meet the demands of the global economy, centered around information technology, in the new century. The program's focus on mathematical talent development has been well-received by society, reflecting a strong demand for mathematical experts and presenting unprecedented opportunities and challenges for the advancement of the field of mathematics. Many scholars have conducted in-depth research on the issues related to talent development in information and computational science-related majors in universities. In reference [1], the primary focus is on the precise teaching and training in the field of applied mathematics at financial and economic colleges, using the case of the "New Finance and Economics" reform at Hebei University of Economics and Business to explore the talent development model for applied mathematics majors. Reference [2], on the other hand, addresses the practical needs of the modern financial industry and discusses the models, methods, and approaches for cultivating financial mathematics talents in financial and economic universities, particularly in the context of big data. It emphasizes the integration of economic and financial backgrounds into foundational courses in mathematics and statistical analysis, nurturing students' abilities to use mathematics and statistics to solve economic and financial problems. The paper also advocates for teaching methods such as discussion-based classes, laboratory sessions, and practical training to effectively produce applied financial talents for the financial industry.

References [1, 2, 3, 4, 5, 6] explore various aspects of mathematical models and mathematics education in the context of precision education in the era of big data, proposing multiple feasible solutions. Meeting the requirements of fostering innovative capabilities in higher education is a significant challenge for the development of information and computational science majors in universities. References [7-9] focus on researching curriculum systems for information and computational science majors in the age of big data. Given the advent of the big data era, it is essential to investigate the direction in which financial and economic universities should develop their information and computational science programs.References [10-11] point out that in the context of the profound development of information technology, it is crucial to clarify the mission of talent development in information and computational science majors, emphasize innovation in educational thinking, promote curriculum reform, and integrate fundamental theory, experimental teaching, and engineering practice to continually optimize the talent development model for information and computational science majors.

Jiangxi University of Finance and Economics (JUFE) has been admitting undergraduate students for the Information and Computational Science (ICS) program since 2000, making it a popular science major at the university. As is well-known, establishing a successful mathematics program at financial and economic colleges is a challenging endeavor because mathematics is considered a foundational discipline and its development is often constrained. In the early stages of this program at JUFE, there were issues such as an unclear program focus, outdated talent development models, a disorganized curriculum system, and a lack of distinctive features in program construction. Particularly in financial and economic colleges, there is often a lack of comprehensive support for mathematics and no infrastructure for information engineering disciplines found in engineering colleges. Consequently, the ICS program, even at financial and economic universities, is still in the exploratory phase. The question of how to effectively manage and develop the ICS program in financial and economic colleges is worthy of discussion. JUFE's ICS program, in line with the university's actual circumstances, has addressed these challenges. With the overarching goal of "strengthening mathematical foundations and developing information and computational science," and leveraging the university's doctoral program in management science and engineering, as well as a postdoctoral research station, JUFE has established a specialization in econometrics within the ICS program. It focuses on five key areas: "curriculum design," "core courses," "high-quality faculty," "exemplary classrooms," and "talent development models," leading comprehensive reforms within the program. These reforms are characterized by their innovation and practical significance. Drawing from the experiences and practices of JUFE's ICS program, other financial and economic universities can learn valuable lessons for the distinctive development of their own Information and Computational Science programs.

II. MAJOR MEASURES TO DEEPEN THE COMPREHENSIVE REFORM OFINFORMATION AND COMPUTING SCIENCE.

(1) Cultivating a "first-class faculty" to enhance the effectiveness and warmth of our university's undergraduate education in information and computing. Nurturing "Four-Qualities Educators" who are compassionate and caring in their teaching. Implementing ideological and political education throughout the entire curriculum process, with a "veto power" over teacher ethics and conduct in talent recruitment. "Bringing in and nurturing." Cultivating teaching and research teams that excel in education and enjoy it, improving teaching execution effectiveness. "Going out and fostering communication." Supporting academic visits and exchanges, collaborating in nurturing a "dual-teacher" faculty.

(2) Creating "first-class classrooms" to enhance the vibrancy of undergraduate education in the field of information and computing. Building "first-class classrooms" by implementing reforms such as flipped classrooms and blended learning to increase classroom engagement, with a focus on student-centered approaches. Leveraging students' "digital native" characteristics to design "learning content" and teaching styles that stimulate creativity. Emphasizing outcome-based education by aligning goals, content, skills, course activities, and support in the curriculum assessment system reform.

(3) Reforming the talent development model to enhance satisfaction in talent cultivation. Making classrooms the primary battleground, continually advancing the reform of the talent development model. Continuing to improve the undergraduate mentorship system, strengthening mentors' guidance for students. Promoting a four-dimensional experiential education mechanism encompassing "in-class, out-of-class, on-campus, and off-campus" to nurture innovation and entrepreneurship skills. Identifying teaching and research issues, initiating educational reform projects, publishing educational reform papers, and enhancing teaching quality.

(4) Implementing the "Four-Dimensional, Six-Transformations, Dual-Subject Interactive" training model reform. Through the synergy between in-class teaching and out-of-class practice, on-campus culture and off-campus experience in the "four dimensions," and by applying six teaching strategies that involve teacher-student interaction, situational design, thematic development, project implementation, responsibility, and democratic evaluation, we aim to cultivate students' innovation and practical abilities. In the past three years, we have led 12 innovation and entrepreneurship training projects, with 12 participants receiving national awards in competitions such as Mathematical Modeling and the Challenge Cup, as well as 43 provincial awards.

(5) Information and Computing Science majors leverage the school's management platform to adjust training objectives, revise training programs, redesign the curriculum structure, reconstruct teaching content, establish practical teaching platforms, and develop an innovative teaching evaluation system based on the Outcome-Based Education (OBE) philosophy. We explore a model that integrates mathematics and management

to create a cross-disciplinary approach. In our teaching practice, we emphasize the distinctive features of financial and economic disciplines, emphasizing the "mathematics + data intelligence + finance" requirements. Through the integration of the "three classrooms," we have built a "three-dimensional permeation" professional talent development model that prioritizes knowledge dissemination, skill development, and character enhancement.

(6) In the face of the requirements of information technology development, adhering to the interdisciplinary professional development teaching concept of "strengthening the foundation of mathematics, intersecting advantageous disciplines, and focusing on innovative application", the major adjusts the training goals, organically integrates mathematics, computer and finance, and continuously improves the training program; Taking the goal of professional ability training as the starting point, reset the curriculum system, set up cross-curricula, redesign professional courses with the support of the school's advantageous disciplines, and build a module course group of mathematics, computing, and economics and management; Reconstruct the teaching content, enrich the knowledge of business management, attach importance to the application of mathematics in economic management and information processing, integrate economic information models, and highlight the quantitative analysis ability of economic management; Establish a practical teaching platform, strengthen practical teaching links, carry out practical activities according to the latest professional content, and cultivate compound talents who can use quantitative analysis methods to solve economic management problems; Adhere to the five educations at the same time, promote the three comprehensive education, and build a "three-dimensional penetration" talent training model that "focuses on knowledge transfer, focuses on ability training, and focuses on literacy improvement". This major keeps pace with the times, adapts to the requirements of digitalization and intelligence, and builds a composite talent training model of "mathematics + digital intelligence + finance", highlighting the characteristics of the information and accounting major in financial universities.

(7) Research and build an objective and reasonable evaluation system for the cultivation of information and computing science talents, such as the evaluation method can be realized with the help of big data information technology, the evaluation content should emphasize the evaluation of students' comprehensive ability, and the evaluation subject can be composed of schools, enterprises, teachers and students.

III. THE CURRICULUM REFORM HAS BEEN CARRIED OUT IN DEPTH, AND THE CONSTRUCTION OF QUALITY ENGINEERING PROJECTS IS GRATIFYING.

Explore and establish a set of talent training models for information and computing science majors in financial colleges and universities suitable for the background of digital economy and the characteristics of "new finance and economics", improve the target system of information and computing science talent training in financial colleges and universities based on students' mastery of theoretical knowledge and practical innovation ability, and promote the construction and improvement of curriculum system, teaching methods and evaluation system to achieve accurate training goals based on the results-oriented OBE (Outcomes-based Education) teaching concept. It is proposed to absorb and cultivate teachers with information technology, mathematical literacy, financial literacy, big data analysis and other construction plans.

(1) On the basis of high-quality courses and high-quality resource sharing courses, focus on building a number of "gold course groups" or "MOOC groups". In 2016, "Decision Theory and Methods" became a national resource sharing course, and in 2018, "Operations Research" and "Econometrics" were transformed and upgraded to national and provincial MOOCs. The mix of online and offline has led to a revolution in the classroom and fruitful teaching results. Carry out online and offline hybrid teaching reform based on flipped classrooms, micro-courses, MOOCs, etc. Econometrics and other management courses widely use case teaching, mainly MOOCs and offline seminars; Mathematics courses such as mathematical analysis are mainly based on board books and supplemented by PPT; Computer courses such as database principles and C++ programmingare mainly based on flipped classrooms, micro-courses, and experimental teaching.

(2) The combination of "internal training" and "external introduction" has steadily improved the teaching staff and outstanding teaching and research achievements. Introduce talents according to the ratio of mathematics, computer and economics and management modules, give play to the leading role of the national teaching team in management decision-making and decision-making support, ensure that each teacher is positioned accurately, and improve team cohesion. In the past four years, it has introduced 1 overseas doctor, 8 domestic doctors, trained 2 Jinggang scholars, 1 provincial "double thousand talents", and 2 academic and technical leaders of major disciplines in Jiangxi Province. In the past four years, he has established 13 national

projects, and published many authoritative papers in domestic and foreign journals such as Economic Research, European Journal of Operational Research, JDE, Science in China: Mathematics, etc.

(3) High social recognition, strong sense of student identity, and breakthrough results in professional assessment. Information and Computing Science (Econometrics) of Jiangxi University of Finance and Economics ranked first in the comprehensive evaluation of Jiangxi Province in 2016, and was rated as a first-class professional construction point in Jiangxi Province in 2019, and a national first-class undergraduate construction major in 2020; In the past three years, the acceptance rate of one volunteer has exceeded 90%, and the contract employment rate has exceeded 90%; The progression rate is about 30%, and many graduates have been admitted to the University of Sydney, Hong Kong Polytechnic University, Xi'an Jiaotong University, Jilin University, Beijing Normal University, University of Electronic Science and Technology of China, Soochow University and other universities.

IV. CONCLUSION

Give full play to the advantages of the digital economy era, and establish the innovative concept of "backward course system based on graduation requirements, backward course content with market demand, and backward ability training with talent job responsibilities". Establish an innovative model of precision teaching reform and practice suitable for the training of information and computing science professionals in financial colleges and universities centered on students' personalized talents. Combined with the OBE (results-oriented) concept, we mainly focus on the issues of "scientific positioning characteristics", "training programs", "golden course groups" and "first-class teachers", "first-class classrooms", "talent training mode", "curriculum ideology and politics", etc., carry out theoretical research and field research, conform to the development trend of the digital economy era, keep pace with the times to improve the training mode of information and computing science talents in high-finance universities, promote the construction of college courses and teaching reform practice, and help make up for the research blind spots of information and computing science majors in financial colleges. In response to the major needs of the reform and development of information and computing science majors in financial colleges and universities under the background of digital economy, it is helpful to solve the bottleneck problem of information and computing science professionaltraining in financial colleges.

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REFERENCES

[1] CHEN Yingwei, ZHAO Xuemei, WANG Zhijun. Research on the teaching and training mode of applied mathematics in the era of big data. Education and Teaching Forum, 2020, 26(06): 155-156.

[2] ZHOU Xiang, WEI Yu. Research on the training mode of financial mathematics professionals in financial and economic colleges and universities under the background of big data. Industry and Technology Forum,2019,18(05):200-201.

[3] LI Bo, WANG Lei, WANG Chao. Mathematical models and some problems of precision education in the environment of big data. Mathematical Modeling and Its Applications, 2017(4): 32-40.

[4] CHEN Xuhong. Research on the Teaching Reform of Higher Mathematics Classroom in Economics and Management under the Background of Big Data. New Curriculum Research, 2017(6): 37-39.

[5] HU Lianggen, CHEN Yingwei. Mathematics Education in the Context of Large-scale Admissions: A Case Study of the Experience of Ningbo University. Journal of Ningbo University,2008(4):7-10.

[6] CHEN Yingwei, WANG Zhijun. Research on the "FSSC" talent training model of applied mathematics in local finance and economics universities. Tech Style. 2018(17):52.

[7] LIU Fenghua, SU Youhui. Research on the curriculum system of information and computing science for big data. Science and Technology Innovation Herald, 2016(24): 131-133.

[8] LIU Chun'an. Optimization, reform and practice of curriculum system of information and computing science in the era of big data. Journal of Higher Education,2016(21):70-74.

[9] LU Chunxia. Information and computing science in the era of big data. Asia-Pacific Education,2016(04):90.

[10] HAO Shuixia, GUO Yunxia. New exploration of information and computing science professional training mode in the era of big data. Journal of Jiangsu Normal University (Natural Science Edition), 2016, 02: 72-75.

[11] LI Jiangong. A brief discussion on the training mode of application-oriented talents ininformation and computing science in colleges and universities. Communication World, 2017, 05: 291.