Curriculum Reform and Construction of Investment Major in the Context of Fintech

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Abstract: With the rapid development of information technology, new technologies such as large data and block chain are boosting the innovation of traditional financial industry. The merging of finance and technology is an inexorable trend of the leapfrog development of financial industry in the future. The innovation and development of financial technology relies on the support of talents. Therefore, the cultivation of the talents of the investment major is facing great opportunities. In the context of Fintech, the existed curriculum system of the investment major in our university needs to make timely adjustment and improvement to adapt to the new requirements of the industry. This paper discusses the issues about how to improve the curriculum reform and construction of the investment major.

1. Introduction

In August 2019, People's Bank of China issued the Fintech Development Program (2019-2021). According to the program, major banks, securities and other financial institutions in China have drawn up corresponding Fintech development blueprints, taking Fintech as one of their core competitiveness. As a result, institutions continue to increase their investment in Fintech. In 2019, the total investment in Fintech in national Banks exceeded 100 billion yuan, with an annual growth rate of over 30%. Although all financial institutions are aware of the importance of Fintech, the lack of professional and interdisciplinary talents has always been the biggest difficulty facing financial institutions in developing Fintech. According to the survey, there is a shortage of 1.5 million Fintech professionals in China. With the rapid increase in the demand for Fintech talents and the imbalance between supply and demand in the market, some Chinese universities have also noticed the new changes in the human resources market and started to set the new major of Fintech or adjust the professional emphasis of some majors to adapt to the new changes in financial industry. By March 2020, Chines Ministry of Education has approved 20 domestic universities to offer Fintech majors, indicating that China's Fintech talent training has entered the stage of rapid development [1]. However, the rapid development of Fintech field requires that the professional curriculum setting and training mode related to Fintech in colleges and universities should keep pace with the changes of Fintech industry, so as to adapt to the industry's demand for talents.

2. Introduction to Fintech

2.1 The connotation of Fintech

Fintech is defined as the convergence of finance and technology. More specifically, Fintech refers to, with the help of information technology, promote the financial innovation, and create new business models, new applications, new processes, as well as new products in the finance industry, which will have a great impact on the financial market, financial institutions and the ways of providing financial services [2].

2.2 The core contents of Fintech

At present, the four recognized core technologies in the Fintech field are the big data technology, cloud computing, blockchain technology and artificial intelligence.

The big data technology mainly refers to the acquisition and storage of massive data, and the analysis of the internal correlation and characteristics of data. The big data technology is able to provide forward-looking decisions, improve user experience, and obtain higher value and profit. Banks can use the big data of consumer transactions to effectively carry out precision marketing, identify fraudulent transactions, conduct loan risk assessment and anti-money laundering analysis.

The cloud computing can connect the data center of all financial institutions to constitute a cloud network which will improve business processes, build Internet core systems, and effectively reduce the operating costs of financial activities. The cloud computing technology maximizes the efficiency of intelligent customer service, face account, risk control and other innovative cloud applications, which reshapes the future financial system.

The artificial intelligence technology refers to the ability of computers to make intelligent decisions through the training of large amounts of data. In financial activities, machine learning, natural language processing and other technologies can be used to provide solutions for multiple situations such as white lings of financial institutions' customers, income scoring and intelligent adjustment.

The blockchain technology mainly uses cryptography and distributed bookkeeping technology to ensure that transaction records cannot be artificially tampered, reducing the risk of trust, and improving the accountability of the system. Digital currency is an example of application of blockchain technology. In the future times, the blockchain technology can be applied in various fields such as digital credit investigation, and intelligent contract management etc. This technology can effectively solve the trust problem between the two sides of the transaction, so as to prevent the emergence of financial risks to a certain extent.

These four kinds of technologies support and are closely related to each other in function and application, and make a joint effort to promote the financial innovation [3-6].

3. Major problems of existed investment courses in our university

The Department of Investment in our university has set up a new professional orientation of quantitative investment in the new training program: a professional orientation with strong theory and application. On the one hand, the quantitative investment requires a higher level of mathematical and computer theoretical foundation; on the other hand, the financial theoretical knowledge of quantitative investment is also more comprehensive. However, our existed curriculum system and talent training program still cannot keep the pace with the development of today's financial industry. In the context of Fintech development, the financial industry puts forward higher requirements on the professional level of teachers and students. The investment major requires a large pre-requisite knowledge base; however, our existed curriculum system still needs to be improved.

3.1 The unscientific teaching content and curriculum sequence

Due to the comprehensive characteristics of the investment major, the students are required to take a variety of major and elective courses of investment in their undergraduate years. The major courses include finance, corporate finance, investment, cameralistic, statistics, econometrics, investment banking, securities investment, etc. While the elective courses involve financial marketing, financial intermediation, international economics, investment fund management and portfolio management, etc. However, many courses have the problem of overlapping with other courses. For example, there are nearly 30% of similar contents between the major course Investment Banking and the elective course Management of Investment Funds. Therefore, how to deal with the problem of repetitive contents in different courses is one of the most significant part of investment major's pro-

fessional development. In addition, due to the short construction time of investment major, we still have some problems in training talents. One of the major problem is the unscientific teaching sequence. For example, the Investment course, in terms of contents, is the extension and expansion of the Corporate Finance course. Additionally, the Investment course is more difficult for students to master than the Corporate Finance course. Therefore, having these two courses in one semester is not a scientific arrangement for students. The better and more reasonable curriculum sequence is to learn the Corporate Finance course first, and then to study the Investment course in the following semester.

3.2 Low level of interdisciplinary teaching

Though our university is now equipped with corresponding experimental courses, like Python, a mainstream computer language in Fintech recently. However, undergraduate students are still not able to master this computer language due to its difficulty and the short course time. In the context of Fintech, the investment major has derived from the traditional liberal-arts. To successfully complete the core courses of investment major, students must first master the necessary mathematics courses. According to the existed curriculum, investment major students are required to learn relevant math courses such as Calculus, Linear Algebra, and Probability and Mathematical Statistics, which will be of great help to the subsequent professional course study. Despite all the above mentioned math courses, there are still many math courses that students haven't been exposed to such as Stochastic Process and Partial Differential Equation which are used a lot in the relevant professional courses. In this case, the relevant professional knowledge are still lightly understood by students. In addition, the curriculum of the investment major focuses on mathematics and computer languages, which has a high requirement on students' mathematical ability. However, most of the investment major students come from the liberal-arts and are averse to difficult subjects like math and computer science.

3.3 Incompetent teachers and inadequate university-enterprise cooperation

The quality of teachers, who play an active role in the teaching process, determines the teaching quality of courses and the quality of personnel training. The Quantitative Investment course has a high requirement on the comprehensive quality of the teachers. The teachers of the Quantitative Investment should be equipped with a solid theoretical foundation as well as some practical experience. But most college teachers went directly to work in the university or college after graduation, lacking of industry practical experience. Therefore, these teachers may be biased in their teaching and guidance. At present, our university has already set up some professional experimental courses. Unfortunately, the long-term joint cultivation relationship with some excellent enterprises has not been established, and the training base invested outside the school still needs to be strengthened. In addition, the current level of student engagement is still relatively low in the practical courses. Therefore, how to integrate the advanced experience in the investment process of excellent cooperative enterprises into practical teaching is still a difficult problem in practical teaching.

4. Suggestions to promote the reform and construction of investment courses in our university

Currently, the Fintech industry shows the demand for compound, innovative and applied talents. As the product of the convergence of finance and science and technology, the talents in the Fintech industry must be interdisciplinary talents. According to the actual situation of our university, we should adjust and perfect the talent training scheme of investment major and promote the discipline construction to a new height.

4.1 Deepening interdisciplinary integration

The Quantitative Investment major has high requirements on mathematics and computer language, and on students' mathematics and programming foundation. Therefore, to enhance the quality of educating talents, the university can set up particular tests to select students who fit for the Quantitative Investment major. For example, all the freshmen in the Institute of Finance and Economics should take part in the written tests and interviews, and then according to the test result, university could select the appropriate students for the Quantitative Investment major. After selecting the students, the university should deepen the interdisciplinary integration. First of all, the curriculum should pay emphasis on the study of basic theories of mathematics and physics. During the first and second years, the university should strengthen the teaching and assessment of mathematical courses such as calculus, linear algebra, probability and statistics. The total course time of the basic theories of mathematics should be extended as well. In addition, to deepen the interdisciplinary integration, the university should encourage the relevant teachers to enhance the communication and learning with each other, and develop new courses. Finally, by organizing relevant lectures, online courses, and club activities, the university can help students of the investment major to communicate with those of other majors, and to expand their horizons.

4.2 Optimizing curriculum

Compared with the existing talent training program, the compulsory courses of the major need to be sorted out, and the teaching sequence and syllabus need to be optimized. For example, in the learning of the Corporate Finance course, course time of the relevant chapters such as the time value of currency, financing structure, dividend policy, and the management of operating capital should be increased. Additionally, the university can add more cross-disciplinary elective courses, especially the courses of computer and mathematics. As for the computer courses, the emphasis should be placed on C programming language, data analysis, artificial intelligence, machine learning etc. While as for the mathematics courses, courses such as partial differential equation, financial mathematical modeling, stochastic process and ordinary differential equation should be added accordingly.

4.3 Strengthening professional teacher training and university-enterprise cooperation

The improvement of teaching quality needs the support of high-quality teaching team. The investment is an interdisciplinary subject with strong connection between theory and practice, therefore; the investment major needs the teacher with a background in finance, mathematics and computer science. Whereas the teachers currently engaged in teaching and research activities in our department usually only have the professional background of finance and mathematics. Hence, our university should actively introduce the domestic and foreign outstanding compound, innovative talents. In addition, we can also train the existing teachers by various ways. In the next place, we should strengthen the breadth and depth of cooperation with off-campus enterprises. In addition to build the off-campus training base for students and carry out on-the-job practice, we should also encourage teachers to temporarily investigate relevant enterprises and actively participate in investment projects of enterprises, so as to integrate knowledge mastered in practice into teaching and research and promote the construction of teaching team. Meanwhile, we can also invite some senior executives and relevant technical personnel of the cooperative enterprises to join us. With the joint effort of them, we can together research the relevant textbooks and share the information of the industry. Finally, we should also encourage teachers and students to take part in the relevant meetings and forums to enhance the industry communication.

5. Conclusion

The development of technology greatly promote the development and innovation of the finance industry. Fintech is showing an unstoppable trend, and Fintech talents are an important factor to promote the progress of Fintech. So it is extremely urgent to cultivate compound financial talents to meet the needs of the society and the financial industry. In the context of Fintech, there are still many deficiencies in the construction of investment courses in our university. To cultivate higher level talents in the financial industry, it is necessary to adjust and perfect the curriculum construction of relevant majors in our university. This paper puts forward some corresponding measures and improvement suggestions in view of the deficiency of curriculum construction of investment major, such as adding relevant elective courses, strengthening the examination of experimental practice courses, building teachers team, and enhancing university-enterprise cooperation etc. It is hoped that these proposed measures can improve the quality and influence of the investment major in our university and cultivate compound, innovative and applied talents for the society and financial industries.

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