

Research on the Integration of Industry, Education, Research, and Application Based on the Collaboration between Banks and Universities: A Case Study of Saxo Business School at Sanya University

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Abstract: With the rapid development of financial technology, the demand for professional talents in this field is becoming higher and higher. Compared with other financial majors, financial technology major was established relatively late. The first financial technology major was approved in 2018, and then various colleges and universities in China began to establish financial technology majors, and continuously improved the talent training mode and curriculum teaching system. This article takes Saxo Fintech Business School, which was founded by Sanya University and Saxo Bank of Denmark, as an example to explore the integrated education model of industry, university, research and application based on the collaboration between bank and school.

Keywords: Collaboration between Bank and School, Fintech, Saxo Fintech Business School USY

1. Research Background

1.1. Industry-Education-Research-Application: An Important Talent Cultivation Model for Applied Undergraduate Universities

Industry, education, research, and application cooperation education is an important model for applied undergraduate education. This model refers to the optimization allocation and rational distribution of social resources such as science and technology, funds, equipment, and personnel to achieve the respective organizational goals of the cooperative parties through a certain system. By sharing and complementing innovative resource capabilities between enterprises, universities, and research institutes, a practical and applied talent cultivation environment is constructed to facilitate the transformation from theoretical education to practical education. In the process of promoting economic and social development, education has always occupied an important position. The report of the 19th National Congress of the Communist Party of China pointed out that "building an educationally strong country is the fundamental project for the great rejuvenation of the Chinese nation. We must give priority to education, deepen education reform, accelerate the modernization of education, and provide satisfactory education for the people." In terms of specific implementation paths, it emphasizes "deepening the integration of industry and education, and cooperation between schools and enterprises to achieve the connotative development of higher education." The contradiction between the "difficulty in employment" of university graduates and the "labor shortage" of employers has become a key issue in higher education reform. On the one hand, employers spend a large amount of capital on human resources recruitment to find suitable talents. On the other hand, in contrast to the "labor shortage", there is the phenomenon of difficulty in employment for university graduates. From the perspective of labor supply, the reasons for this phenomenon are: first, the knowledge and abilities accumulated by university graduates at the time of graduation are difficult to meet the job requirements of enterprises; second, university graduates have high expectations for job positions, and they are unwilling to accept job positions provided by enterprises when the conditions in industrial enterprises cannot meet their expectations.

1.2. Issues in Industry-Education-Research Collaboration in Universities

In the collaboration between universities and banks in industry-education-research cooperation, there has always been a phenomenon of "universities being enthusiastic while banks being indifferent". Many collaborations are limited to the signing of strategic cooperation agreements and industry-education-research cooperation agreements, but most of them remain at the contractual level, with very few achieving deep collaboration. However, in the talent cultivation of finance-related majors, in order to avoid the disconnection in talent cultivation and better meet the personnel needs of banks and other financial institutions, closer cooperation with employers is necessary. Based on this, it is necessary to change the traditional "classroom-centered" theoretical teaching model, strengthen communication with banks and other financial institutions, and achieve effective information exchange and sharing. When universities set talent cultivation programs, they should benchmark the demand characteristics of their human capital and organize teaching accordingly to achieve deep integration of industry and education, and achieve good synergistic effects in talent cultivation. Therefore, exploring the collaborative model of "research-based learning and industry-education integration" has practical significance and application value.

1.3. Financial Technology: A Excellent Majors Established under The background of The New Liberal Arts

The "new" in the New Liberal Arts represents innovation. It unifies the qualitative analysis methods and quantitative analysis methods of liberal arts, demonstrating the scientific nature of the New Liberal Arts. Under the background of the New Liberal Arts, the talent cultivation and professional construction of the Financial Technology major differ from traditional finance majors. In terms of talent cultivation objectives, in addition to cultivating a comprehensive understanding of economics and finance fundamentals, students should also possess practical skills in financial operations and the ability to use computer science and emerging technologies to enhance the efficiency of financial services as FinTech professionals. Specifically, the cultivation should prioritize moral education and promote the comprehensive development of morality, intelligence, physicality, and aesthetics. In addition to systematically mastering the fundamentals of economics and finance and possessing practical skills in financial operations, students should also be able to apply their knowledge of computer science and emerging technologies such as big data, blockchain, and artificial intelligence to solve technical problems in financial services and improve the efficiency of financial services. They should be competent in system development and maintenance, product design and promotion in financial institutions and FinTech companies as advanced applied FinTech professionals.

1.4. The Financial Technology Major of Sanya University: "Double First-Class" construction majors in Hainan Province

The Saxo Business School at university of Sanya is a financial technology business school jointly established by university of Sanya, which is wholly owned by Geely Holding Group, and the globally leading financial technology institution, Saxo Bank from Denmark. The school launched the Financial Technology major in 2019, making it one of the first five Financial Technology majors offered nationwide. Since its establishment, the school has focused on the construction of key disciplines in "digitalization of the financial industry" and "modern service industry." Its educational vision revolves around redefining talent cultivation, professional training, and professional capabilities for practitioners in the financial industry through financial technology. The goal is to cultivate versatile and applied talents who understand finance, technology, and possess practical skills, thereby creating professional value in the field of financial technology and leading the education of Financial Technology majors.

In 2020, the Financial Technology major at the school was recognized as a first-class undergraduate program in Hainan Province, and in 2021, the Applied Economics discipline under the school was designated as a key discipline in Hainan Province. In 2022, the school, along with 14 other financial and economic institutions such as Central University of Finance and Economics, Shanghai University of Finance and Economics, Southwest University of Finance and Economics, and Northeast University of Finance and Economics, jointly established the Financial Technology Virtual Teaching and Research Office approved by the Ministry of Education. Currently, the school is a demonstration base for financial education in Hainan Province, a member of the China Financial Technology Education and Application Innovation Alliance, a director unit of the Hainan Financial Association, one of the first pilot institutions for the "Digital Currency Electronic Payment" (DC/EP) in China, and was recognized as a "National

Demonstration Zone for Digital Currency" in 2021. In 2022, the school joined the Shenzhen-Hong Kong-Macao Financial Technology Talent Plan as a co-initiating unit.

The school has collaborated with Saxo Bank to establish an expert team composed of academia, industry, and government. Currently, there are 32 full-time and part-time teachers, with 60% of the full-time teachers holding senior titles and doctoral degrees, and 85% of them having overseas educational backgrounds. The Financial Technology major admitted 42 students in 2018, 63 students in 2019, 70 students in 2020, and 119 students in 2021, with a total of 325 students enrolled. The school has also established the Financial Innovation and Multi-Asset Intelligent Trading Laboratory, which provides students with experimental platforms for financial multi-asset trading, open banking, digital currencies, and quantitative investment.

2. Literature Review

The concept of "Industry-University-Research Collaboration" has a history of over a hundred years. In 1862, the United States Congress passed the Morrill Land-Grant Act, which allowed states to receive land grants from the federal government for the establishment of agricultural and mechanical universities. These universities were obligated to provide education, knowledge dissemination, and social services related to agriculture and mechanics. The Morrill Land-Grant Act marked the beginning of the practice of collaboration between industry, academia, and research.

Xuelong Peng and Xiaodong Zhao (2005) consider the Bayh-Dole Act as another important milestone in the theory and practice of collaboration between industry, academia, and research^[1]. According to this act, the ownership of patents resulting from research projects funded by the US government can be transferred from the government to higher education institutions and research organizations. This made it possible for the private sector to have patent rights over federally funded research outcomes, providing institutional support for collaborations among higher education institutions, research organizations, and industry. It greatly stimulated their enthusiasm for collaboration.

Currently, research on collaboration between industry, academia, and research mainly focuses on four aspects: the perspective of technological needs of companies, the perspective of supply from universities and research organizations, the study of approaches to collaboration, and the impact of collaboration on companies.

Firstly, from the perspective of technological needs of companies, Huimin Liu et al. (2023) argue that companies can acquire technological innovation capabilities through participating in collaboration between industry, academia, and research^[2]. They can also benefit from knowledge spillover effects and gain more returns from technological innovation. Collaboration can also help companies acquire other types of innovative resources, leading to short-term competitive advantages and long-term strategic advantages. This reduces costs and risks for companies and has a positive impact on their long-term growth.

Secondly, from the perspective of supply from universities and research organizations, the research capabilities, professional experience, and academic reputation of researchers have a greater impact on collaboration between industry, academia, and research. Caibin Zhu and Guosheng Zhang (2023) suggest that strong research capabilities and high academic reputation are more attractive to companies^[3]. Larger universities indicate stronger research capabilities, making companies more willing to actively cooperate with them.

Thirdly, research on approaches to collaboration between industry, academia, and research mainly focuses on the implementation of collaboration through means such as patent rights and technology licensing. Hao Zhang(2021) analyzed patent data from the United States and found that collaboration between industry, academia, and research has become more active. Given the importance of patents in commercial interests, the number of patents obtained by US universities continues to grow, with a focus on technological applications^[4]. Wanhui Lu (2023) conducted empirical research and found a significant positive correlation between companies' participation in collaboration between industry, academia, and research and the number of patents they obtained^[5]. Higher education institutions and research organizations contribute to the innovation outcomes of companies through collaboration in two ways: first, by developing applied patents based on existing knowledge and second, by promoting the dissemination of tacit knowledge, which helps to enhance the company's innovation capabilities. While these studies have some reference value, they lack universality and their content is not systematic, mostly summarizing case studies and pilot experiences. Therefore, based on the theory of industry-academia-

research collaboration, is beneficial to construct an industry-university cooperation model from the perspective of specific disciplines, which is a useful supplement to the existing theory. Additionally, designing practical training collaboration plans that are in line with the characteristics of the discipline using existing social resources is of great practical significance for improving the quality of financial talent cultivation.

3. The Construction of Industry-university-research Integrated Education Mechanism

3.1. Coordination between Bank and University

The quality of talent cultivation is a core factor determining the competitiveness of a university. For applied undergraduate colleges, it is important to conduct industry research and discussions, understand the industry's pain points in talent demand, and revise the talent cultivation program based on the forefront trends of industrial development. In the revision of the talent cultivation program at Saxo Financial Technology Business School, suggestions from co-building units such as Saxo Bank and its institutions were sought, as well as input from financial regulatory agencies, commercial banks, securities, insurance, and other financial institutions. Through joint discussions, innovative talent cultivation programs, curriculum system construction, teaching and research methods, and college management and support mechanisms were developed.

3.2. Curriculum System Based on Industry-university-research Integration

Through the establishment of co-building courses between the university and enterprises, Saxo Financial Technology Business School has deepened the reform of the curriculum system. The "2+6 model" has been implemented, where Saxo Bank and industry experts share practical industry knowledge through lectures, and domestic and international renowned university experts and professors teach theoretical knowledge to students. Currently, six co-building courses have been established based on the business situations of co-building units, including digital currency, financial simulation trading practice, open banking, quantitative investment, supply chain finance, and big data finance. Except for financial simulation trading practice, which is taught in the first year of university, the other courses require students to have a solid foundation in finance and financial technology before taking them in the third and fourth years of university.

3.3. Construction of Internship and Training

Traditional co-building internship and training bases between universities and enterprises often only scratch the surface, with simple contracts signed or students sent to companies to perform basic work during their third and fourth year breaks. By conducting in-depth research on enterprises or issuing questionnaires, the needs of enterprises can be understood in real-time. In addition to off-campus internship bases, on-campus internship bases can also be established. Especially after experiencing the epidemic, the public has become familiar with the use of digital tools across regions and spaces. For example, in the first year of university, students can deepen their understanding of enterprises by helping them with basic business such as conducting surveys of enterprise customers; in the second and third years of university, students can intern in different departments based on their understanding of enterprise departments; in the fourth year of university, students can choose employment as their goal.

3.4. Cultivation of a Dual-teacher Workforce Based On Industry-university-research Integration

The main goal of teacher training is to "bring in" industry teachers and cultivate "dual-competency" teachers. This includes how to incorporate enterprise mentors into teaching, what courses enterprise mentors are suitable to teach students, and how to construct a complete enterprise teacher curriculum system. Taking Saxo Financial Technology Business School as an example, different enterprises in the financial industry, such as foreign banks, financial technology companies, commercial banks, policy banks, securities companies, futures companies, and insurance companies, are invited to provide industry guidance to students when they enter university in the first year. In the second year of university, students are taught about the subdivision businesses in the industry. The third year mainly focuses on teaching business cases, and in the fourth year, students learn about industry employment planning. In addition, it is also important to send school teachers to work in enterprises for 3-6 months of job-specific internships. After being sent out, teachers will have a deeper understanding of the enterprise's business, which is

beneficial for developing teaching cases closely related to the enterprise.

3.5. Platform of the Industry-University-Research Collaboration Service

The improvement of practical teaching level is achieved through the establishment of collaborative laboratories and practice platforms between universities and enterprises. On one hand, as enterprises are primarily profit-oriented and possess up-to-date industry dynamics, they can effectively address the problem of "teaching lagging behind the industry". On the other hand, teachers and students can also stay connected with the industry and its dynamics through practice platforms. Taking Saxo Financial Technology Business School as an example, the school invests in hardware for the laboratories, while enterprises are responsible for building the teaching platforms. The Financial Technology Matrix Innovation and Entrepreneurship Incubation Center, on the other hand, is provided with projects by enterprises, and teachers guide students in completing these projects together. Through hands-on experience, students not only gain insights into cutting-edge industry knowledge but also contribute research output from the practice platform back to the enterprises.

3.6. Construction of Student Activities and Extracurricular Education

Different from primary and secondary schools, where teaching is the main focus, university students are expected to participate in student activities and extracurricular education in addition to completing classroom learning. By involving enterprises in student activities and extracurricular education, students' horizons can be expanded. Taking Saxo Business School as an example, students actively participate in activities within the city based on their majors. For instance, students majoring in financial technology engage in activities related to the popularization of digital currency in Sanya, such as collaborating with commercial banks. They apply their knowledge to practice by teaching residents and tourists about the principles and usage of digital currency. Simultaneously, they actively collaborate with enterprises to organize financial knowledge events on campus and participate in job fairs, deepening the understanding of enterprises about the school and students, thus laying a foundation for future student employment.

4. Strategies and Suggestions Industry-University-Research Integration

Enhancing Awareness of the Importance of Industry-University-Research Integration from the Perspective of Educational Demand For applied undergraduate universities, deep integration between industry and education is an effective way to improve the quality of talent cultivation. If we consider the educational demand from the perspective of students' needs, then the focus of educational reform should be on improving the quality of talent cultivation through industry-university integration. Students' satisfaction with industry-university integrated courses and teachers is crucial for enhancing the learning process and ensuring the long-term success of theoretical and experimental teaching. Students' satisfaction with professional internships is also important for improving their qualities and abilities, and better integrating into society. By measuring satisfaction based on students' service experience, continuous educational improvement can be promoted.

To enhance students' confidence, it is crucial to not only focus on their academic achievements but also acknowledge and nurture their accomplishments in course-related projects, intellectual pursuits, and leadership experiences. This can be achieved by encouraging students to participate in competitions and join campus organizations. This can be achieved by encouraging students to join campus organizations and participate in competitions. Currently, financial technology students participate in various competitions, including the Undergraduate Innovation and Entrepreneurship Training Program, the "Xindao Cup" Sand Table Simulation Business Competition, the "Challenge Cup" Extracurricular Academic and Technological Works Competition, the "Oriental Fortune Cup" National College Students' Financial Challenge, the National Financial and Securities Investment Simulation Training Competition, and the MathorCup University Mathematical Modeling Challenge, among others, and have achieved awards at national and provincial levels. Moreover, more than two-thirds of the surveyed students have either participated in or are currently involved in campus organizations.

Joining campus organizations and participating in competitions reflects the level of student engagement in campus activities. The more competitions students participate in, the more opportunities they have to apply theory to practice. Involvement in campus organizations, whether in the past or present, demands higher personal abilities and dedication, providing a platform for personal growth and development. Faculty members can introduce various campus competitions and organizations to students

at the beginning of their studies and provide guidance and assistance for extracurricular competitions. Additionally, in the process of teaching professional courses and conducting experiments, consciously connecting the teaching content with extracurricular competitions can enhance students' overall practical abilities. By increasing the proportion of students participating in competitions and joining campus organizations during their professional development, the overall level of students' practical abilities can be enhanced.

Enhancing the Status of Internship and Experimental Teaching in Talent Cultivation Since its establishment, university of Sanya has been committed to cultivating applied talents that meet the needs of society. The College of Financial Technology at university of Sanya has signed internship contracts with various institutions, including Saxo Bank, Saxo Financial Technology Company, CITIC Construction Investment, Galaxy Securities. In addition to the existing internship units, the major should focus on employment and entrepreneurship guidance, particularly emphasizing the application of new technologies in the four major areas of traditional finance: commercial banking, securities investment, insurance, and risk management. This will showcase the integration of finance and new technologies. Through internships, the major aims to cultivate versatile, applied, and high-quality talents who possess knowledge in finance, technology, and hands-on skills.

In 2018, the College of Financial Technology established the Financial Innovation and Multi-Asset Intelligent Trading Laboratory, equipped with the teaching system Saxo Trader Pro provided by Saxo Bank from Denmark. This system allows students to trade over 40,000 financial products in global securities markets, including stocks, bonds, futures, options, and contracts for difference. The laboratory also benefits from discounted rates and exchange rates provided by Saxo Bank. The financial asset experiment components of courses such as Securities Investment, Corporate Finance, and Investment Banking for undergraduate students majoring in Financial Technology are conducted in this laboratory. The college should continue to innovate in teaching, increase the utilization rate of the laboratory, introduce professional experimental personnel with backgrounds in computer and financial operations, and explore the integration of professional courses with the laboratory. This will break through traditional teaching methods and enhance students' practical abilities, innovation capabilities, and hands-on skills.

In order to promote team building and foster students' participation in teacher research teams, it is important to recognize that the establishment of such teams serves as a comprehensive reflection of the teachers' research capabilities and research directions. As one of the first batch of "Double First-Class" construction majors in Hainan Province, the College of Financial Technology at university of Sanya has interdisciplinary experts, industry experts, and teaching experts. The college has undertaken multiple vertical research projects, including national social science major projects, Hainan Provincial Social Science Fund projects, and Hainan Provincial Education Department projects. It also undertakes various horizontal research projects from the Sanya Financial Commission, Hainan Branch of China CITIC Bank, Saxo Financial Technology Company, and others. Several dozen papers have been published in domestic and international core journals.

While focusing on the construction of teacher research teams, it is also important to involve professional students in research team building. At the beginning of students' enrollment, they should be encouraged to participate in teacher research teams to enhance their professional identity. Teachers can identify students with a strong interest in research during the teaching process and allow them to fully participate in the teachers' research process. This will enhance students' awareness of applying their professional knowledge to theoretical research, as well as their sense of belonging and identification with the college and major.

5. Conclusion

Saxo Business School plays a crucial role in talent cultivation and research in the field of finance and technology. By focusing on enhancing internship and experimental teaching, the college aims to cultivate versatile and applied talents who possess knowledge in finance, technology, and hands-on skills. The establishment of the Financial Innovation and Multi-Asset Intelligent Trading Laboratory provides students with practical opportunities to trade in global securities markets and enhances their practical abilities and innovation capabilities.

Additionally, Saxo Business School emphasizes the importance of team building and encourages students to participate in teacher research teams. By involving students in research projects, the college aims to enhance their professional identity and foster a sense of belonging and identification with the college and major.

Overall, university of Sanya is committed to providing high-quality education and research opportunities, contributing to the development of the finance and technology industry in Hainan Province. With its interdisciplinary experts, industry partnerships, and research projects, the college is well-positioned to produce graduates who are well-prepared for the challenges and opportunities in the evolving field of financial technology.

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