The Path of Utilizing the Integration of Industry and Education to Improve the Data Literacy of Finance and Economics Majors in Vocational Colleges under the Background of Digital Economy

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Abstract. The digital economy is an important direction for the future economic development of China. Cultivating talents with the background of the digital economy has become the main direction for cultivating financial and economic professionals in current vocational colleges. The digital economy is driving the high-quality development of China's economy. In the context of the digital economy, the operation of enterprises is gradually undergoing digital transformation. The cultivation of digital talents has become a humorous key task. Faced with the shortage of digital talents in the digital economy and the structural employment problem in the industry structure, vocational colleges must establish a teaching system that integrates industry and education, with a focus on cultivating students' data abilities. Vocational colleges have demonstrated outstanding applicability, service, and regionalism in their educational characteristics, highlighting regional social development and economic construction, providing services and support for core technologies of industrial enterprises, and playing a key role in the informationization construction of Chinese universities. Therefore, implementing the integration of industry and education is an inevitable choice for vocational colleges to enhance students' digital literacy.

Keywords: Digital economy, Digital management, Integration of industry and education.

1   Introduction

With the rapid development of big data and artificial intelligence technology, the global data volume is growing rapidly, and the application of big data is becoming more and more widespread. Data driven decision-making is receiving increasing attention from various fields[1]. The development of big data technology has become an important means of competition for various enterprises. Vocational colleges should adapt to the development of the times, recognize the importance of data literacy, and provide qualified data talents for enterprises and society.

2   Current Status of Data Literacy Cultivation for Students in Finance and Economics Colleges

In vocational education, the integration of industry and education is increasingly valued. The essence of industry and education integration lies in the coordinated development of various organizations in society, utilizing the complementary advantages of multiple parties to achieve resource sharing. At present, scholars have analyzed the development process of industry education integration and proposed a transformation from talent cultivation to school enterprise cooperation in industry education integration, from innovative teaching models to the evolution of industry education integration into a talent cultivation system in universities [2]. To build a system for industry education integration, it is necessary to comprehensively consider the interests and demands of stakeholders such as the government, universities, enterprises, and social organizations, and improve the education system for industry education integration. The development of industry education integration in domestic industrial colleges is in full swing. Universities with different types and disciplinary specialties have different positioning and directions for industry education integration development, and should be treated differently and developed with distinctive characteristics.

2.1   Data Literacy: Important Skills for Financial Vocational College Students

In 2022, the accounting and computer majors at Tsinghua University will be combined. Traditional accounting majors can no longer meet the needs of society, and students majoring in finance and economics also need a lot of data literacy knowledge and skills. With the widespread and in-depth application of big data technology in various industries, it is imperative for financial vocational college students to enhance their big data skills [3]. Especially the application of big data technology in finance and economics has become the basic skill foundation for vocational finance and economics students.

2.2   The Realistic Dilemmas Faced by Vocational College Students in Data Literacy Education Practice

The data literacy education for vocational college students in finance and economics is facing a practical dilemma of insufficient theoretical knowledge but lacking practical research. The existing research on the data usage ability of vocational college students mainly emphasizes the cultivation of their big data theoretical skills, lacking thinking on the actual financial data acquisition ability under the background of big data, and also lacking practical application of financial data utilization thinking and financial data ethical standards. Financial vocational college students are the reserve force for the future development of financial talents [4]. They will face a future social environment characterized by the development of financial data.

3   The Data Literacy Ability Framework and Indicator System of Financial Vocational College Students

To design school enterprise cooperation activity projects to cultivate the data literacy of vocational college students, it is necessary to clarify what data literacy is, as well as the ability to use data that vocational college students need to master and the interrelationships between various dimensions of ability. This can provide target references for school enterprise cooperation activity projects and improve the pertinence of school enterprise cooperation activity projects. Therefore, the elements of data literacy ability for vocational college students are divided into four dimensions: data awareness, data knowledge and skills, data thinking, and data ethical norms [5].

3.1   The Connotation and Characteristics of Data Literacy Among Vocational College Students

3.1.1 The Connotation of Data Literacy Among Vocational College Students.

The improvement of data literacy among vocational college students has a direct promoting effect on the quality of talent cultivation in vocational finance education, which is conducive to the individual autonomy and employment development of vocational college students [6]. This study can help finance and economics vocational college students recognize their level of data literacy, and also add essential skills for finance and economics students to participate in school enterprise cooperation projects, employment and entrepreneurship.

3.1.2 Characteristics of Data Literacy among Vocational College Students.

Financial data literacy is the ability to collect, process, and analyze financial data. With the development of big data technology, data literacy has become a fundamental quality for financial and economic students. Students are required not only to have the ability to collect, filter, integrate, and analyze financial data, but also to have data awareness, knowledge and skills, and ethical literacy in data.

3.2   Construction of a Data Literacy Ability Framework for Vocational College Students

Based on the learning characteristics of vocational finance students, this article divides their data literacy into four dimensions: data ethics, data awareness, data knowledge and skills, and data thinking.

The ethical standards for data are a prerequisite for the entire cooperation between schools and enterprises in data management, and they are also data laws and regulations that students should abide by. Develop data awareness, knowledge and skills, and data thinking based on data ethics standards. Among them, data awareness is the leading condition, the primary attitude that enables students to learn data knowledge and skills, the intuitive cognition of data learning, and one of the factors that promote data knowledge and skills [7].

3.3   Construction of a Data Literacy Ability Index System for Vocational College Students

Starting from the connotation of data collection ability, based on the social needs, teaching characteristics, and student ability status of vocational college students in finance and economics, data collection ability is divided into four dimensions: data awareness, data cognition and skill ability, data thinking, and data ethics literacy, as shown in Figure 1.

Data awareness includes students' sensitivity to data, accuracy in judging the value of data, and judgment of the logical relationship between data. The whole is the experience and judgment of financial data formed by students during the school enterprise cooperation period, which shows the prerequisite for students to carry out school enterprise cooperation projects to solve practical problems, and the judgment condition for whether students can actively recognize the data.

Data thinking is a complete set of physical activities in which students fully utilize the long-term accumulated data of companies to guide decision-making, management, production, and business activities in the era of big data. Establishing data thinking enables students to establish quantitative analysis methods and operate on related issues and data materials [8]. Establish the correlation between data and problems, and explore the interrelationships. Propose solutions based on data analysis results, and be able to dialectically evaluate the rationality of obtaining data and results.
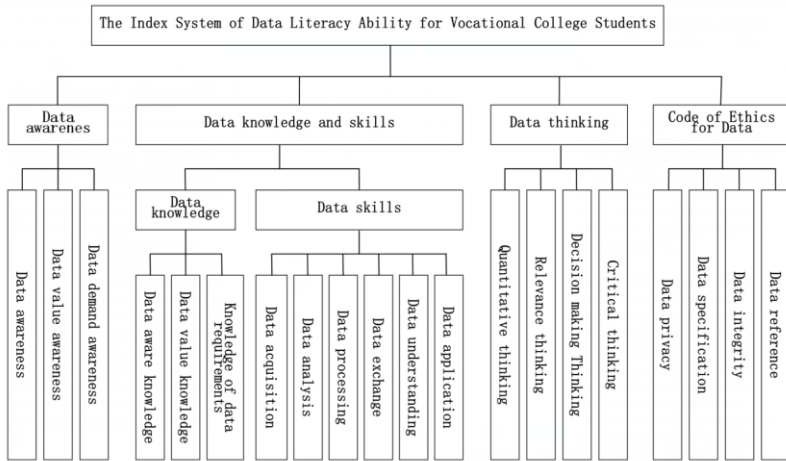

Fig. 1. Indicator System for Data Literacy Ability of Vocational College Students

4   Design of a Model for Enhancing Digital Literacy in the Practice of Integration of Industry and Education for Finance and Economics Students in Vocational Colleges

The school enterprise cooperation activity project, as a learning activity that uses data as learning material, needs to design a theoretical model for the school enterprise co-operation activity project. It is necessary to clarify the relationship between data literacy cultivation and school enterprise cooperation activity projects, define the core elements and main processes of data exploration learning, and gradually clarify the practical activity model of industry education integration.

4.1   Analysis of the Elements and Processes of Integrating Industry Education Integration Practice into Exploratory Learning

The process of industry education integration inquiry learning includes four core elements, namely school enterprise cooperation context, proposing digital learning problems, student independent exploration, and teacher-student collaboration [9]. The entire learning process enables students to analyze a complete data analysis problem, propose, solve, and discover data analysis methods, promoting the construction and improvement of student digital literacy knowledge. This operating mode reflects the subjectivity of students and the leadership of teachers both on and off campus, providing a preliminary design for the entire process of digital analysis teaching. This design helps improve the efficiency of students' self-directed learning.

4.2   The Compatibility between Exploratory Learning and Data Literacy Cultivation in the Practice of Integrating Industry and Education

The teaching mode of data literacy and the exploratory learning through the integration of industry and education practice activities can fit well, because both emphasize the importance of students' self-directed learning and reflect their sense of autonomy. And exploring problems in real data business through school enterprise cooperation can help students gain a sense of value in data value acquisition, form a good data awareness, master data analysis skills, and showcase digital charm. And through collaboration and cooperation among groups, students can discover the strengths of their peers, learn from each other, and supervise and guide each other. By showcasing and exchanging the final data results between groups, reflecting and improving data thinking, students can maximize their digital literacy.

4.3   Exploration of Learning Elements and Process Design for School Enterprise Cooperation Data

The school enterprise cooperation data exploration learning activity is a learning activity method that takes data learning as the learning method. In this study, the elements of the school enterprise cooperation data exploration learning activity are determined

as school enterprise cooperation data, school enterprise cooperation context, data context, data questions, exploration questions, collaborative exploration questions, conclusion analysis and evaluation of the entire project process. In this study, the exploration of school enterprise cooperation data was conducted through group collaboration, and the learning activity of school enterprise cooperation data exploration was ultimately presented in the form of data results reporting.

4.4 Exploring the Key Points of Learning Activity Design for the Integration of Industry and Education Practice Activity Data

Based on the data exploration of the integration of industry and education practice activities, this study summarizes some design points of the integration of industry and education practice activity data exploration learning activity design, mainly including five aspects: school enterprise cooperation context, school enterprise cooperation data goals, specific data content, data strategies, and data evaluation [10].

4.4.1 Starting from the Data Context of Industry Education Integration Practice Activities.

Teachers introduce activities based on real school enterprise cooperation data resources, creating a real data foundation for students, enabling them to use real enterprise data, and providing strong support for students to carry out exploratory learning. On campus and off campus teachers provide students with the most advanced data technology and methods, allowing them to use information technology tools or big data software to screen, process, and analyze real data. In inquiry based learning, the available digital and online resources provided by teachers should be abundant enough for students to find solutions to problems.

4.4.2 The Learning Objective is to Enhance Students' Data Literacy.

The school enterprise cooperation data exploration learning activity project aims to enhance students' data literacy as the main goal, focusing on enhancing their development requirements in data awareness, data basic knowledge, nuclear energy, data thinking, and processing methods. The main purpose of the entire school enterprise cooperation data lasso learning activity project is to help vocational and financial students form systematic data thinking, and cultivate their methods and abilities in using data. Finance vocational college students have gone through a complete and authentic process of obtaining data, analyzing effective information, and making decisions and conclusions. By experiencing the entire process of data generation, processing, analysis, and application, students have achieved practical operation of data knowledge and skills, and achieved the goal of cultivating data awareness and thinking.

4.4.3 In terms of Learning Content, the Core is Real Data from Enterprises.

The learning content is always designed around "real data of enterprises", so that students can understand their learning priorities and difficulties during the school enterprise internship stage, enhance their data perception, enhance their awareness of data acquisition, and understand more about the use of data collection methods and tools. Be able to master basic data analysis methods, master the use of data analysis tools, and form a complete set of methods and strategies for data acquisition, data collection, data filtering, and data analysis applications to solve data problems. In the design of teaching content, attention should be paid to the latest learning trends of students and the focus of learning should be adjusted in a timely manner. And the overall learning content is logical, capable of breaking down data tasks and facilitating collaborative problem-solving among groups.

4.5   Design of a Learning Model for Data Exploration of Industry Education Integration Practice Activities

Based on the framework of data element literacy ability constructed in the previous article, combined with the process of industry integration and data exploration learning, a data exploration learning model for industry integration and practical activities was constructed, as shown in Figure 2.

Financial data awareness includes the behavioral tendencies of perceiving financial data, discovering its value, and clarifying the needs for using financial data. It is the perceptual ability that students acquire in the process of integrating industry and education. School enterprise cooperation practice activities provide students with a source and spatial environment for learning financial data. Based on the real-life scenarios encountered by financial students in social practice, students are encouraged to think about the sources of financial data from the context, make judgments on the value of financial data, discover and think about financial data, and gain benefits from using financial data. Real financial learning scenarios can also promote students to establish connections between financial knowledge and actual financial task environments, achieving effective transfer and application of financial data knowledge. Real tasks and environments can enable students to better enter an active state, think about the purpose of completing the scenario and the knowledge reserves needed to complete it, analyze it, and then start practicing the task.
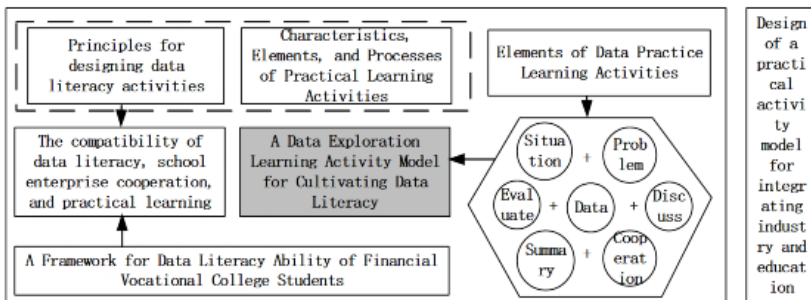
Fig. 2. Data Exploration Learning Model for Industry Education Integration Practice Activities

4.5.1 Problem Inspiration.

After entering the real situation, students are mentally prepared. At this point, the off campus guidance teacher raises core questions, allowing students to think with financial issues and see the essence of financial data problems under the guidance of the off campus teacher. Through thinking about financial issues, students establish a preliminary connection between financial data and financial issues, determine financial data requirements based on financial issues, feel the value of financial data in solving financial problems, and strengthen their awareness of financial data.

4.5.2 Exploration of Team Collaboration.

The team collaboration exploration of financial data is a key link in the learning and practice of data exploration. In this process, students play a major role, with "financial data" as the core, in obtaining, processing, and analyzing financial data, extracting financial information, drawing conclusions, and forming decision-making opinions and suggestions. Firstly, the study group utilizes big data software to obtain the necessary data through independent operation, and makes objective judgments on the authenticity of financial data, identifying financial data issues and conducting preprocessing. Then, based on the purpose and analysis points of financial data usage, use big data financial software tools for data analysis, appropriately use big data graphics to display financial data indicators, and improve the effectiveness and intuitiveness of financial data information communication. Finally, summarize financial information, form financial conclusions, and propose financial decision recommendations. In terms of cooperation methods, reasonable arrangements should be made based on the workload of practical projects, and students should be flexibly grouped. Off campus teachers mainly guide students in practical activities during this stage, providing methods and technical support in data processing and analysis, and ensuring the implementation of financial data learning activities. In team collaboration exploration, the collection, processing, and analysis of financial data have been carried out, realizing the practical application of financial data knowledge. This helps students deepen their understanding of financial knowledge points, exercise their financial data knowledge and skills, and enhance their ability to understand financial data.

5   Conclusion

This study explores the constituent elements of data literacy among vocational finance and economics students, and categorizes data literacy into four dimensions: financial data knowledge and skills, financial data thinking, financial data awareness, and financial data ethical standards. Among them, financial data thinking is a higher-order goal and a hub for connecting data literacy abilities in the other three aspects. Its specific manifestation is the cognitive strategy of using financial data to solve financial problems.

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