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Development and Practice of Data Analysis Course for Business Major in Higher Vocational Colleges

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ABSTRACT
In order to meet the needs of enterprises for business data analysis talents, business majors in higher vocational colleges have opened data analysis related courses. Taking the course development of data analysis for business talents as the research object, this work systematically summarized three core issues in the course development, creatively used the three dimensions (process, method and tool) to build the course system, and formed a complete set of course design ideas with the aid of dimension combination and scene switching. Subsequently, the college has achieved preliminary results through basic courses for freshmen and practical training courses for sophomores.
Keywords: *Business data analysis; Course development; Higher vocational business major; Ability training*

1. INTRODUCTION

With the vigorous development of Internet, big data, artificial intelligence, etc., the application of data analysis in the commercial field becomes increasingly necessary and important. This also makes the industry and enterprises for business data analysis talent demand continues to rise [1]. To this end, business majors in higher vocational colleges have set up courses related to data analysis. Since 2014, the School of Business Administration, Shandong Institute of Commerce and Technical has opened e-commerce data analysis course under the major of e-commerce data analysis. Consequently, remarkable achievements have been made in the teaching resources development, curriculum achievements transformation, participation in competitions and professional employment. Therefore, the college has decided to organize a team of teachers to develop the basic course of business data analysis and application for all freshmen in higher vocational business major and the practical training course of business data analysis for all sophomores since July 2019.

However, the course team encountered many problems at the beginning of course development. For example, how to get out of the professional limit and find the data analysis ability that business professionals need to have? How to select the course content with data analysis capability? How to adjust the course difficulty for students in different grades? To this end, the team communicated with local enterprises on talent demand, studied the college's professional development plan and talent training program, and learned from the advanced experience of other institutions. Finally, with data analysis activities as the main line, process, methods and tools as the dimensions, an unprecedented course system was creatively constructed combined with common business scenarios of enterprises. After the first round of development and teaching practice, the teachers' and students' feedback effect is good. Along the way, the course development is bittersweet, and thereby the author summarizes some achievements and experience in the current course development, hoping to enlighten and help colleagues interested in the development of business data related courses.

2. THREE CHALLENGES IN COURSE DEVELOPMENT

Course development is a complex process. Firstly, the professional development plan in college needs to be deeply interpreted. Secondly, it is necessary to communicate with each professional responsible person about the professional training objectives and students' situation. Thirdly, it should formulate the teaching syllabus, build the curriculum content framework, and collect and produce teaching resources. Among them, the author mainly encountered three challenges.

The first challenge is what to talk about (i.e., the construction of course system and content organization). In the previous teaching plans, there were also courses related to data analysis, such as market research and analysis, e-commerce data analysis, statistics, etc., yet they all had significant professional characteristics. Currently, a course that reflects the training objectives of data analysis talents and adapts to different professional business activity scenarios needs to be developed[2-3], and thus we need to find its universality in different majors. This is the innovation of course development work, and it is difficult to find ready-made framework and teaching resources.

The second challenge is how much to teach (i.e., the difficulty of the course content). The college's business major students include the general college entrance examination, the spring college entrance examination, the independent enrollment, etc., which makes the students'

knowledge structure different. At the same time, the difference of students' origin will also affect students' current learning and practical ability. For example, students in some areas are more proficient in using computer and network technology, and even can program. However, students in some areas can only complete the basic office software operation. On the other hand, the courses developed by the team include both basic courses for freshmen and practical application courses for sophomores. Diversified course settings also put forward different requirements for course development.

The third challenge is how to say it (i.e., the presentation of course content and the implementation of classroom teaching). The current students in higher vocational colleges are all born after 2000, which requires the teaching team to find the course content presentation form and teaching interaction method that can improve their learning interest and conform to the learning rules at this stage [4]. For freshmen, it can help them complete the transition from middle school to college courses and adapt to the learning scene in college. For sophomores, it is necessary to help them complete the connection between school learning and employment, so that they can understand the value and application of business data analysis in future work.

3. THE CORE IDEA OF COURSE DESIGN

To complete the task of course development, the core idea of course design focuses on how to deal with the three challenges mentioned above.

3.1. Building a Course System Using One Transformation and Three Dimensions

After thinking and practicing the course orientation, the author first deals with the first challenge through one transformation and three dimensions. In retrospect, the courses related to data analysis before the college all took the typical business activities of their majors as the main line. For example, the "market survey and analysis" took marketing professional market survey activities as the main line, and the "e-commerce data analysis" took e-commerce professional e-commerce operation activities as the main line [5]. As a universal course, business data analysis should not be biased towards any single major, but should be based on its own characteristics data analysis activities.

The main line of data analysis activities can be expanded from three dimensions, including the process, methods, and tools of data analysis. The data analysis process to refine the generality of data analysis activities under different occupational scenarios. Currently, it is widely accepted and applied in six steps:

(1) Defining issues and reviewing historical findings;
(2) Variable determination and data acquisition;
(3) Data exploration and preprocessing;
(4) The application of data analysis method;
(5) Results analysis and visualization;
(6) Results execution, model evaluation and feedback.

In each stage of data analysis process, corresponding data analysis methods and tools can be used. For example, the main analysis methods are comparison and deconstruction in the first step "defining issues and reviewing historical findings". In the specific implementation, models such as PEST analysis, Porter's five forces analysis, SWOT analysis, etc., can be flexibly selected based on the business scenario. Enterprises can use external data such as macro market report and industry market report, and internal information such as enterprise strategic planning and business status to find out the core issues. Then, brainstorming, mind mapping, etc., are used to deconstruct the problem, sort out the relevant business processes, and obtain the path to solve the problem in different model frameworks. The data analysis methods and tools involved in the other five steps can refer to Figure 1.

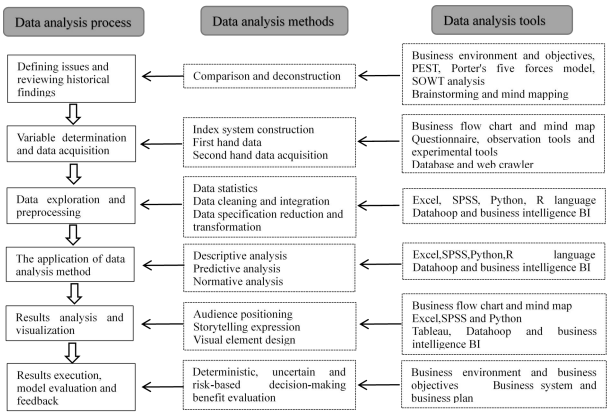

Figure 1. Three dimensions of data analysis activities

In the whole data analysis process, the application of the data analysis method in step 4 is the core, and it is also a difficult link to grasp in teaching practice. Therefore, a quick reference table with data analysis method, variable number and data type as the identification is constructed. It not only covers the application methods of data analysis in the current business environment, but also classifies and focuses different methods, as shown in Table 1. Through the quick reference table, teachers can flexibly design the teaching content, thus completing the construction of course business scene, data preparation and teaching guidance. Students can establish a logical knowledge system, quickly and effectively select data analysis methods and tools, and enhance the application ability of data analysis in different business scenarios.

Table 1. Quick reference table for application of data analysis method

Data type (qualitative & quantitative)	Univariate analysis	Bivariate analysis	Multivariate analysis
Descriptive analysis	Qualitative: frequency analysis, statistical indicator analysis Quantitative: distribution analysis, statistical indicator analysis	Qualitative & quantitative: cross contingency table	Qualitative & quantitative: cross contingency table, cluster analysis, correlation analysis, corresponding analysis, funnel model
Predictive analysis	-	Quantitative: regression analysis, time series, analysis, classification prediction analysis	Quantitative: regression analysis, classification prediction, analysis
Normative analysis	-	Quantitative: A/B test, experimental method	Quantitative: A/B test, inventory optimization, production optimization, experimental method

3.2. Adjusting Course Depth with Dimension Combination and Scene Switching

With the main role of data analysis activities clearly defined, the course depth can be flexibly adjusted by grasping the analysis process, method and tool content and preset scenes switching, thus adapting to different students and course forms.

For example, the platform course for all freshmen majoring in business requires that the course contents should be basic and universal. Students only need to experience the complete data analysis workflow, master the basic business analysis methods and the use of office software. The background of the project also includes online shopping, offline retail, etc.

However, the whole week training course for all sophomores majoring in business requires the course to be comprehensive and operational. Students should be skilled in designing and planning the work flow of data analysis, thoroughly understand the business analysis methods learned in previous courses, and master the operation of specialized data analysis platform and software. The project background is based on the students' major, such as internal business, marketing promotion, cross-border trade, etc.

3.3. Running through Teaching Activities with Interesting and Understand Ability

In order to ensure that the course system and teaching objectives can be effectively communicated to students, the author's teaching team established an interesting and understand ability course design concept in the teaching process after conducting sufficient communication and investigation on students of various majors.

In the interesting aspect, efforts should be made to make business scenarios story based, data analysis process game oriented and data analysis application life-oriented. The course is composed of one or more data analysis projects with complete process. Each project has complete story design and role setting. Students will be given certain roles and responsibilities, thus having a strong sense of substitution in the learning process. The data analysis process has a certain sequence. In the process of project development, students need to complete the previous step to unlock the next step. Therefore, the game design of the course can stimulate students' awareness and initiative. On the other hand, the course also introduces the application of these methods in daily life when data analysis methods and tools are taught, such as self exploration SWOT analysis, learning planning mind map, using web crawler to collect my favorite baby, double eleven sales forecast, etc.

With regard to understand ability, the teaching team has developed a series of micro lecture video, animation, case and other teaching resources around the course content. In the teaching process, interactive games, team tasks, brainstorming, etc., are introduced to deepen the interpretation of core knowledge points [6]. It is necessary to guide students to apply the knowledge points to transform the application results, such as using the data analysis results and solutions to offer support for cooperative enterprise business decision-making, and participate in data analysis related competitions.

4. COURSE IMPLEMENTATION PROCESS

Accordingly, the team completed the "business data analysis and application" for freshmen majoring in business and the "business data analysis for whole week training" for sophomores in the second half of 2019 and the first half of 2020 respectively. From the evaluation effect of teachers and students, the expected teaching objectives were basically achieved and the response was good.

Taking the "business data analysis for whole week training" as an example, the course implementation process

is briefly introduced. The course lasts for 2 weeks, with a total of 32 class hours. Students are required to complete the Internet book sales data analysis project according to the data analysis process.

First of all, students need to find the core issues to be solved by Internet book enterprises through comparative methods, deconstruct them into specific operational analysis directions and make a mind map. In this link, teachers will guide students to deeply interpret the project background information, explore the business process and deep needs of enterprises, self-study the principle and production method of mind map, and complete the definition and carding of core issues. The teaching process involved in the other five steps can refer to Figure 2.

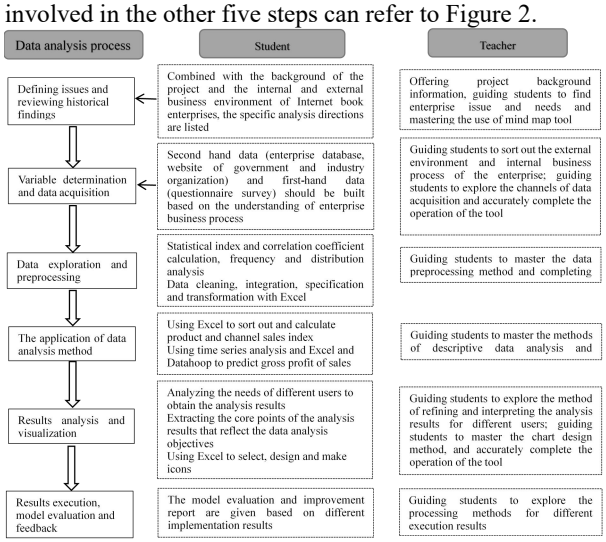

Figure 2. Teaching content design of business data analysis for whole week training

5. TEACHING RESULTS AND ANALYSIS

After more than one year's course design and practice, the course team has achieved three main goals:

5.1. Preliminary Completion of Teaching Objectives

The course breaks through the design pattern with specific professional business activities as the main line, and turns to data analysis activities as the main line, successfully solving the issues of what to talk about and how to talk about. At the same time, the target in cultivating students' awareness and ability of data analysis oriented by business decision under the background of big data has been preliminary achieved.

5.2. Teaching Experience and Material Reserve

In the team teachers' thinking collision and the teaching practice of nearly 400 students, a relatively systematic course system and teaching philosophy have been formed. At the same time, it has accumulated some teaching resources, which laid a foundation for the development of courses for the newly opened business data analysis and application major.

5.3. Promoting the Transformation of Teaching Achievements between Teachers and Students

Through the course learning, students can improve their business data analysis and application ability, and be able to draw inferences and apply them to data analysis related competitions. Seven students applied the new tools to the training of data analysis related competitions and got excellent results.

Through course design and practice, the teacher team cooperated with enterprises to develop the new loose-page teaching material "foundation and application of data analysis", and made complete teaching courseware, micro-course video, animation and case database resources.

6. CONCLUSION

Through in-depth thinking on cultivating data analysis ability of business professionals, the course team summarized three core issues in the course development, creatively used the three dimensions (process, method and tool) to build the course system, and formed a complete set of course design ideas with the aid of dimension combination and scene switching. Subsequently, the college has achieved preliminary results through basic courses for freshmen and practical training courses for sophomores.

Of course, there are also some issues in the teaching process for such a new idea, such as the business background that the project relies on is not rich, and the assessment and evaluation of students are not perfect, etc. In the future, the in-depth cooperation between the course team and the enterprise should be strengthened, and the enterprise scenes should be continuously developed into teaching cases. Then, the enterprise should be introduced to carry out multiple evaluation and assessment on the teaching effect. At the same time, data analysis related courses will be constantly updated and improved combined with the change of enterprise's talent demand and the development of the school's course system.

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REFERENCES

[1] Li Zhichang. Research on Cultivating Business Data Analysis Ability of Economic Management Vocational Students [J]. Decision Exploration, 2020, (14): 70-71.

[2] Yao Jianfeng. Exploration on the Talent Cultivation Concept of "New Business" in Higher Vocational Colleges [J]. China Business Review, 2018, (14): 187-188. DOI: 10.19699/j.cnki.issn2096-0298.2018.14.187.

[3] Jiang Ranran. Research on the New Business Talent Training Model in Higher Vocational Colleges under the Background of "Internet +" [J]. Southern Agricultural Machinery, 2020, 51(9): 161.

[4] Chen Lingxia, Li Zhichang. Research on "Business Data Analysis" Practice Teaching Design in Higher Vocational Colleges Based on Effective Classroom Concept [J]. Heilongjiang Education (Theory and Practice), 2019, (11): 41-43.

[5] Min Min. Development and Implementation of "E-commerce Operation Data Analysis" Course in Higher Vocational Colleges—Taking Changzhou Information Vocational and Technical College as an Example [J]. E-Commerce, 2016, (4): 87-88, 90. DOI:10.3969/j.issn.1009-6108.2016.04.041.

[6] Yang Tiantian. Exploration of Course Development in Higher Vocational Learning Field under the Background of Teaching Company - Taking Business Data Analysis and Application as an Example [J]. Industry and Information Education, 2018, (7): 24-27, 57. DOI: 10.3969/j.issn.2095-5065.2018.07.006.