
Research on the Construction and Development of Computer “Loose-Leaf” Textbook Resources

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Abstract: Textbooks, as one of the important carriers of higher vocational curriculum teaching, play a very important role in the quality of classroom teaching. The content of textbooks directly reflects the advanced nature of curriculum technology, and their arrangement will also promote teachers to actively carry out teaching reforms. In 2019, two documents advocating the use of new loose-leaf textbooks, "Administrative Measures for Teaching Materials in Vocational Colleges" and "Key Points of Vocational Education and Continuing Education in 2019" were promulgated by the Ministry of Education; in addition, the "National Vocational Education Reform Implementation Plan" also highlighted It is necessary to strengthen the reform of "three teachings" in vocational colleges. The research on loose-leaf textbooks at home and abroad mainly focuses on the connotation, characteristics, structural composition, content and application research of loose-leaf textbooks. At present, there are still some problems in the research on the construction of loose-leaf textbooks. For example, theoretical research on the development of loose-leaf textbooks is insufficient, and research on the process paradigm of textbook development is blank. In addition, the research on textbook theory and textbook development practice are incompatible. Moreover, the textbook content and occupational requirements are disconnected. In the compilation process of textbooks, the development adaptability problems are not reasonably judged. In this paper, these problems will be studied in detail.

Keywords: Loose-Leaf Textboo, Vocational Education, Three Education Reform, Textbook Development

1. Introduction

As we all know, textbooks are the carrier of talent training, the basis of teaching activities, and the basic source of knowledge for students. Their important position cannot be shaken. Therefore, the quality of teaching materials is an important factor that determines the quality of personnel training. In recent years, the state has issued a series of major policies to deal with that. In other words, the state is paying more and more attention to teaching materials. Electronic textbooks and loose-leaf textbooks for higher vocational colleges have been studied at home and abroad. The early electronic textbooks in the developed countries have distinctive professional characteristics, which not only focus on application, inspiration and guidance, but also have strong practicability, lively and vivid writing style as well as illustrations. Most of them are the actual pictures. In the early days of vocational education textbooks in China, the content of the subject system was generally used to build

content. Over the past ten years, the reform of higher vocational textbooks has gradually increased. However, there are not many higher vocational electronic development textbooks based on the vocational ability construction, and the excellent textbooks are fewer. Besides, the overall electronic development and construction of higher vocational teaching materials of China lags behind that of foreign developed countries. Under the background of the promulgation of the *Twenty Articles of Vocational Education*, the reform of teaching materials for higher vocational education is imminent. How to timely reflect advanced technology, silently integrate into morality, and cultivate people are the new requirements for the development of higher vocational teaching materials. This research mainly focuses on how to condense the construction paradigm of “loose-leaf” textbooks under the background of occupational type education based on work tasks, and form a teaching material development mechanism integrating production and education.

2. Related Research

2.1. Current Research in Different Country

2.1.1. Vocational Education

In Germany, the compilation of teaching materials for vocational schools is mainly based on the German Constitution, the Basic Law as well as the provisions of the state school laws on teaching standards, teaching objectives, teaching plans and syllabuses. However, the compilation of training materials for enterprises is based on the *Vocational Education* issued by the federal government. The “dual-system” vocational education is a talent cultivation model composed of the above two. In Japan, the compilation of textbooks is mainly based on the *Key Points for Compilation of Textbooks and Textbooks for Development and Training*, which includes the purpose, compilation method, and compilation guidelines. In the UK, the textbooks are usually written to the standards of the *National Vocational Qualifications*. In Australia, the vocational education standard is set up by cooperating with the industry to develop a training resource package according to the needs of the industry, and then the training institutions and vocational schools develop courses and teaching materials after review. [11]

2.1.2. Loose-Leaf Textbook Research

There are very few foreign literatures on the development of loose-leaf textbooks. The earliest foreign literature was published in 1913, and foreign scholars mainly conducted research on loose-leaf textbooks on English literature. For example, Huang Peiyi mentioned that U.S. military academies use “leaf-leaf anthology” textbooks. The chapter framework of the textbook is basically fixed, and the method of loose-leaf and building blocks is adopted for the content. Besides, the latest academic achievements and the recent local war experiences are added to the textbook in time. [1]

2.2. Research in China

Domestic research is mainly divided into two aspects. On the one hand, it is the internal research of loose-leaf textbooks, which mainly refers to the research on the connotation, characteristics, structure, content and application of loose-leaf textbooks. On the other hand, loose-leaf textbooks are printed. The research on the finished book refers to the study on the composition of the printed book and the technical transformation of the finished book.

2.2.1. Research on the Connotation of Loose-Leaf Textbooks

Li Zheng believes that the content modularization of textbooks is the connotation of “loose-leaf” textbooks. In essence, building the smallest unit modules independent of each other with ability as the main body is to change the organization mode of textbook content, rather than to change the external form. [2]

2.2.2. Research on the Characteristics of Loose-Leaf Textbooks

Huang Tao pointed out that the loose-leaf textbooks have

two meanings, namely “loose-leaf” and “textbook”. Zhang Xingran believes that loose-leaf textbooks have three characteristics: project, loose-leaf, and three-dimensional. [4].

2.2.3. Research on the Structure and Composition of Loose-Leaf Textbooks

According to Huang Tao, the structure of higher vocational software development textbooks is task description-task analysis-code example-knowledge analysis-class training-after-class practice. Wu Zhendong proposed the trinity independent thinking mode and the system framework of “loose-leaf learning materials”. Besides, the trinity includes “loose-leaf teaching materials”, “loose-leaf notes” and “functional inserts”. Additionally, Fang Yuting proposed the framework of the “project-oriented-module combination-task evaluation” work-study integrated loose-leaf teaching material system. [5]

2.2.4. Research Aspects of Loose-Leaf Textbook Content

Chen Gaofeng mentioned that the loose-leaf textbook should be based on the typical work tasks of the enterprise, and the teaching evaluation (mutual evaluation, self-evaluation, general evaluation, and comprehensive evaluation) should be integrated into the loose-leaf textbook [6]. Fang Yuting believes that the content of loose-leaf textbooks should not be limited to paper materials, and a corresponding information resource library needs to be built [7].

2.2.5. Research Aspects of the Application of Loose-Leaf Textbooks

Chen Gaofeng took the course of *NX Mechanical 3D Design* as an example, explored the design of loose-leaf teaching materials of “loose-leaf teaching materials + loose-leaf notes”, and analyzed the use of online and offline mixed teaching mode in the actual classrooms [6]. In addition, the research on printed books of loose-leaf textbooks mainly focuses on two aspects: the composition of printed books and the technical transformation of finished books. Some researchers proposed to use electromagnetic coils to control the magnet pieces of each book block, which could easily pop up the required chapters or corresponding pages. Some scholars have designed and applied for a few utility model patents related to the printing of loose-leaf teaching materials.

3. Major Problems

Firstly, the theoretical research on loose-leaf textbook development is not enough, and the research on textbook development process paradigm is blank. That is to say, there are few researches on loose-leaf textbooks of electronic development in higher vocational colleges at home and abroad. The research of loose-leaf textbooks is focused on the development and compilation of textbook content, which is biased towards practical application, while the theoretical research on textbook development is not enough. There is no research on the development process paradigm of loose-leaf textbooks for professional orientation. If the research on this

part of the content is increased, it will enrich the construction of vocational education textbooks in theoretical research of China and further promote the classroom revolution.

Secondly, the theoretical research of teaching materials has not kept up with the practical development of teaching materials, and the content of teaching materials is out of touch with the requirements of occupational positions. Indeed, the most prominent problem of professional course teaching materials is that the content of teaching materials has not kept pace with the times, and there is a big gap with the requirements of professional positions. Therefore, the theoretical research of textbooks should keep up with the pace of practical teaching, because the compilation of textbooks not only requires recombination of knowledge, but also requires research on multiple issues such as how to guide students to learn and how to assist teachers in classroom teaching. This is an extremely complex task.

Thirdly, the function mechanism and value core of teaching materials have not been studied in depth, and vocational education teaching materials have been repeatedly constructed. Due to the lack of thinking about the knowledge problems behind the construction of teaching materials, the mechanism of action of teaching materials and the core of their value, the problem of repeated construction of vocational education teaching materials is more prominent [8].

Fourthly, the adaptability problem is not reasonably judged in the process of textbook compilation, and the content form does not match the purpose of use. More specifically, the contents of professional core courses and other integrated courses of theory and practice are closely linked to the development of regional industries and require stronger ability training. Therefore, the compilation of new forms of teaching materials should fully consider how to update the content of teaching materials in real time, and how to improve the quality and practicability of teaching materials. It fully corresponds to the curriculum standard of the course, always reflects the purpose of teaching materials, and improves the quality of teaching materials through manual, loose-leaf and three-dimensional forms.

4. Policy Basis for Research on the Development and Construction of Loose-Leaf Textbooks

Firstly, the *Administrative Measures for Teaching Materials in Vocational Colleges* has been promulgated by the Ministry of Education, advocating the development of loose-leaf teaching materials. An important sign that the construction of textbooks in vocational colleges in China has entered the stage of standardized development is that at the end of 2019, the Ministry of Education promulgated the *Notice on Organizing and Carrying out the Construction of National Planning Textbooks for Vocational Education in the 13th Five-Year Plan* and *Administrative Measures for Teaching Materials in Vocational Colleges* (hereinafter referred to as the *Measures*). The *Measures* proposes to “advocate the development of

loose-leaf and workbook-style teaching materials in new forms”, and regulate the compilation of teaching materials for vocational colleges. At the same time, the background, connotation and characteristics of the loose-leaf and manual teaching materials are given, providing an important reference for the units to compile the high-quality teaching materials. [9]

Secondly, the *National Vocational Education Reform Implementation Plan* proposes to promote the “three education” reforms of vocational colleges. In February 2019, *The National Vocational Education Reform Implementation Plan* was officially released by the State Council. This plan is the first to advocate the use of new loose-leaf and workbook-style teaching materials and support development of information resources, and to build a large number of school-enterprise diversified cooperative development of national planning teaching materials. At the same time, it proposes the “three education reforms” as well as the reform of teachers, teaching materials and teaching methods in vocational colleges to improve the quality of personnel training. In addition, the key topic of the current professional teaching reform is to focus on solving the problems of how to teach and what kind of teaching materials to use in the daily teaching of schools.

Thirdly, the national *Twenty Articles of Vocational Education* promotes the reform of vocational education teaching materials. Textbooks are one of the important carriers of higher vocational curriculum teaching and play a very important role in the quality of classroom teaching. The content of textbooks directly reflects the advanced nature of curriculum technology, and their arrangement will also promote teachers to actively carry out teaching reforms.

Fourthly, *Key Points of Vocational Education and Continuing Education in 2019* advocates the use of new loose-leaf teaching materials. In April 2019, the *Key Points of Vocational Education and Continuing Education in 2019* was released by the Department of Vocational Education and Adult Education of the Ministry of Education. Among them, in the sixth point *promoting the reform of the ‘three teachings’ and improving the quality of education*, it is proposed to use new loose-leaf and workbook-style teaching materials.

Fifthly, the *Special Work Implementation Plan for Higher Vocational Enrollment Expansion* proposes the development of new loose-leaf teaching materials. In May 2019, it was jointly issued by the Ministry of Education and the National Development and Reform Commission, which mentioned the development of new loose-leaf, workbook and other textbooks suitable for different types of students to meet the development needs of “Internet + vocational education”.

5. The Significance of Research on the Construction of “Loose-Leaf” Textbook Resources

Writing and using loose-leaf teaching materials will be a development trend of vocational education in the future. The research of this subject is of great significance.

Firstly, it is favorable to the formation of the concept of “loose-leaf” textbook construction under the background of vocational education, and provides a theoretical basis for the construction and development of “loose-leaf” textbook resources in the context of vocational education. That is to say, the research on the current situation of “loose-leaf” textbooks under the background of vocational education will help us to have a clear understanding of the viewpoints, directions and research levels of this type of research, provide a basis for the follow-up of “loose-leaf” textbooks under the background of vocational education, and offer a theoretical basis for resource construction and development. At the same time, it will help to condense the concept of “loose-leaf” textbook construction under the background of vocational education in the context of the country’s new requirements for vocational education personnel training and new concepts of curriculum development. The development of teaching materials follows Mr. Tao Xingzhi’s concept of “combining discipline and education, guiding students to learn by doing, and carrying out curriculum ideology and politics, cultivating students’ innovative awareness, labor spirit, craftsmanship spirit, and cultivating professional positions”.

Secondly, it is conducive to refining the “loose-leaf” teaching material construction paradigm under the background of vocational education, and promoting the formation of a normal mechanism for school-enterprise integrated development of teaching materials. Through the integration of production and education, the connection between the classroom and the post can be maintained, and the balance between teaching content and work needs is promoted. Meanwhile, a curriculum construction team, including schools, enterprises, industries, and so on can be maintained. The main body of textbooks is technical experts with rich experience in the industry and enterprises. Moreover, school teachers supplement the teaching and research content, and teaching materials come from the front line of the industry [10]. Besides, the scope of the project is determined, the job responsibilities are clarified, the requirements for the construction of course teaching materials and the course construction cycle are formulated, revision and edit are conducted regularly, and a dynamic work system can be formed. At the same time, the textbooks take the form of loose-leaf and other forms, so that the content can be flexibly revised to ensure that it can keep up with the pace of industry development. [16].

Thirdly, it is beneficial to give full play to the application advantages of “loose-leaf” textbooks under the background of vocational education, and to explore the scientific organizational model of vocational education and teaching. According to the flexible and open characteristics of loose-leaf pages and the supporting digital support conditions, the formation of digital training materials enables teachers and students to fully feel the openness and flexibility of the materials. It also lets the teaching material reflect the function of “user service”, and teachers can flexibly select and sort out course content items. At the same time, the task-based loose-leaf teaching materials are used to

guide students to carry out personalized learning and training and to innovate the teaching organization mode of vocational education. A typical application mode of task-based loose-leaf textbooks is proposed through the practice-feedback-correction-perfect cycle model. Based on the textbooks, teachers design individualized and characteristic practical training courses, guide students to use the textbooks to carry out individualized training, and reflect the vocational education background.

Fourthly, it is conducive to forming a “loose-leaf” textbook teaching organization paradigm under the background of vocational education, mining textbooks to assist teachers in teaching, and guiding students to learn the most effective way to use them. On the one hand, students can study different types of loose-leaf textbook (e.g. project task-based loose-leaf, application workflow index-based loose-leaf, summary-based loose-leaf, test identification, and punch-in loose-leaf). On the other hand, teachers can use the loose-leaf textbook to guide students to complete online and offline learning. It is favorable to fully explore the most effective way of teaching materials to assist teachers in teaching and guide students in learning. In this way, a “loose-leaf” teaching organization paradigm for teaching materials under the background of vocational education can be formed. [13]

6. Conclusion

Firstly, the concept of construction and development of “loose-leaf” textbook resources can be formed under the background of vocational education. There are two aspects of research on the construction and development of “loose-leaf” textbook resources in the context of vocational education. On the one hand, the role and function of “loose-leaf” textbooks can be clarified in the process of ability training and knowledge learning in the context of vocational education. The value of educating people can be fully implemented and has an internal mechanism for knowledge updating. [15]

Secondly, the “loose-leaf” textbook construction paradigm can be refined under the background of vocational education. Thomas Kuhn’s paradigm theory mentions that there are three conditions for the formation of paradigm, namely researchers, rules and historical achievements. The development paradigm of modern vocational education textbooks is based on the paradigm of pragmatism vocational education, the paradigm of situational cognitive learning theory, and the paradigm of vocational education research on talent studies. There is a comprehensive system for the development of textbooks for modern vocational education [12]. The goal of vocational education is to cultivate technical and skilled talents. Therefore, the content of textbooks, the presentation way of the content in the textbooks, and the logical organization structure are the most important points in the current vocational education textbook reform.

Thirdly, the formation of a normal mechanism for school-enterprise integrated development of teaching materials can be promoted. Through the construction of production-education integration training bases, the normal

mechanism of school-enterprise integration development of teaching materials is promoted, and resources such as training venues are provided to give full play to its teaching and educating functions. Meanwhile, the training section is developed with a comprehensive configuration of learners, learning objectives, and learning activities. [10]

Fourthly, a case of innovative practice of "loose-leaf" textbook teaching organization model under the background of vocational education can be established. Based on the materials in the loose-leaf textbooks, including situations, tasks, norms, assessments, etc. [14] from the production line and the industry, the teaching organization mode of practical training teaching is condensed. Besides, students are guided to complete online and offline learning as well as pre-class and after-class training through teaching materials. Besides, innovative practice cases of training teaching organization mode can be formed.

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