



Research on the Construction of Theory and Practice Integrated Course Materials from the Perspective of Artificial Intelligence

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Abstract:

This paper conducts a study on the transformation of vocational education course materials. The framework of course materials is built with the support missions as its motivation. Long short-term memory network is used to establish the correlation between practical tasks and equipment theory, so as to arrange theory and practice content. The information resources, including equipment model, case base and law base, are constructed. Then cases and regulations are integrated into the practical tasks in the form of points to subtly accomplish ideological and political education implicitly. In this way, what's built is the course materials of the integrated system to theory and practice based on mission supports. Practice has proven that the course materials are closely related to the training and reality and meet the students' post-holding needs, which can promote the improvement of professional teaching quality and shorten the pre-service training cycle.

Keywords: long short-term memory; support task; integration of theory and practice; information resources

1 INTRODUCTION

Professional equipment course materials are the important support of course construction, major building and innovation of talent education pattern, as well as the important carrier of teaching reform and the necessary tool of curriculum implementation. At present, the course materials in colleges are mostly textbooks integrated with theory and practice [2], focusing on theoretical knowledge while meeting practical operation needs. They are practical and operable. However, the contents of course materials have not aimed at the constructional principles, using and maintaining a type of equipment. The background of the equipment has not been considered. And the disconnect from practical applications is also a big problem. Because the useable environment is not considered, the theoretical depth is hard to control, and theory and practice cannot support each other. To adapt to the college reform and the development of teaching mode, the innovative transformation of course materials is carried out, the posting-holding ability cultivation is set as goal, the equipment learning is melted into the practical support tasks. Long short-term memory network [1] is used to determine the correlation between task support

requirements, theory and practice. The security awareness training of maintenance is promoted through information resource construction. The course materials integrate the characteristics of educational artificial intelligence and practical support tasks, and give full play to the advantages of information resource construction. Then the needs of vocational education to implement training and carry out self-training based on course materials could be met.

2 THE STRATEGY OF COURSE MATERIALS CONSTRUCTION

The organization of course material contents is accomplished by connecting the teaching demands with the equipment trait. The strategy is listed as below:

2.1 Highlighting the posting-holding ability setting professional support mission as main line

For shortening the training period before pre-service, the synchronization of learning and training must be ensured. During the process, the effective training contents and methods are brought into the classroom and

the course materials. In order to feel the process of task support, the content organization of course materials should focus on the process of equipment support. And the practical subject should be routinized according to actual working processes, which can highlight the clear position orientation of course materials in vocational education. In that case, the normal support skill training can be implemented based on course materials, although the theoretical knowledge is deleted. With constant learning, we can achieve the primal goal of meeting post-holding needs.

2.2 Obeying the rule of equipment support capability generation, which is based on reality, integrated with reality and mutually promoted.

So as to realize the equipment support training and theoretical teaching, the students have to generate the support skill and understand the construction principle knowledge simultaneously. According to the knowledge spreading tactics and ability generation rule of vocational education, the practice process must play a promoting role in understanding equipment [6]. Taking this into consideration, the course materials should integrate the equipment theory knowledge timely and moderately as the mainline of equipment support process. The skill training can be carried out with teaching theory. Conversely, by learning theoretical knowledge, the theoretical perception of practical process and requirements at mission could be further understood. Consequently, organizing the course material contents should obey the support production rule that includes depending on reality, fusing and promoting theory as well as practice reciprocally.

2.3 Highlighting the trait of professional support, and emphasizing the formation of style as well as safety quality

The diversity, complexity and systematicness of supporting objects, as well as the high riskiness exist in the whole process of maintaining. The shape of style and safety quality for learners must be stressed in order that the safety of land maintain can be insured. The relevant training contents should be implemented continuously not only in the teaching process of all curriculums, but also be concretely described in the course materials. By inserting failure cases, regulations and risk prevention means timely and accurately, students can take self-learning and training at the foundation of course materials and feel the importance of right operation style and safety quality entirely. Osmotically ideological education can be achieved. Correct safety concept and value can be formed finally.

3 THE CONSTRUCTION MODEL

In the content arrangement of the course materials, the main line is to ensure the task. It emphasizes the organic integration of supporting task practice, equipment theoretical knowledge, safety regulations and requirements, failure case analysis, reading material expansion, etc. The core is to fully reflect the design concept of post skill training. The purpose is to cognitive and understand the equipment. The course materials faults analysis ability is the deepening part. The maintenance style and safety quality are throughout the cultivation. All these are the design ideas. The content construction model is shown in Figure 1.

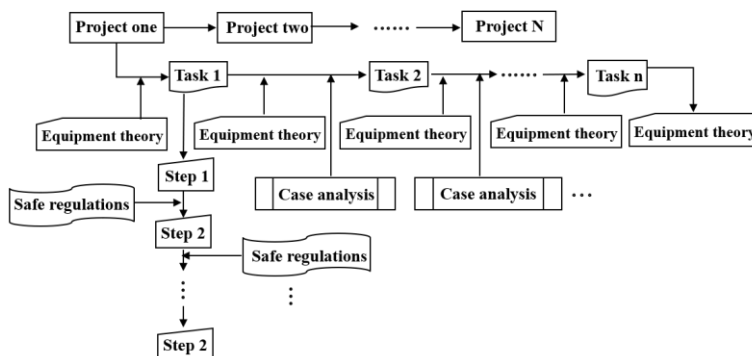


Figure 1: Content construction model of teaching material based on task guarantee.

The graphical model shows the content organization structure of the integrated course materials based on task guarantee. The progress of the whole content is completely based on the maintenance of the actual equipment and tasks as the main line. Systematic equipment theory knowledge is divided into several knowledge blocks closely related to support tasks, and scattered before and after each task. So, it becomes the theoretical foundation for the smooth implementation of the support task or the natural formation after the

implementation of the task. Safety regulations, operating procedures and other contents are all in the form of points into the practical tasks. They can be used to guide, standardize, and warn the task training process. Failure cases are arranged between tasks, after equipment theory.

They can warn the process of task specification, and play a role in the practical application of propositional theory. It fully embodies the design goal of starting from practice to theoretical cognition and then returning to deepening guiding practice. This process completely

accords with the ideological purpose of vocational education.

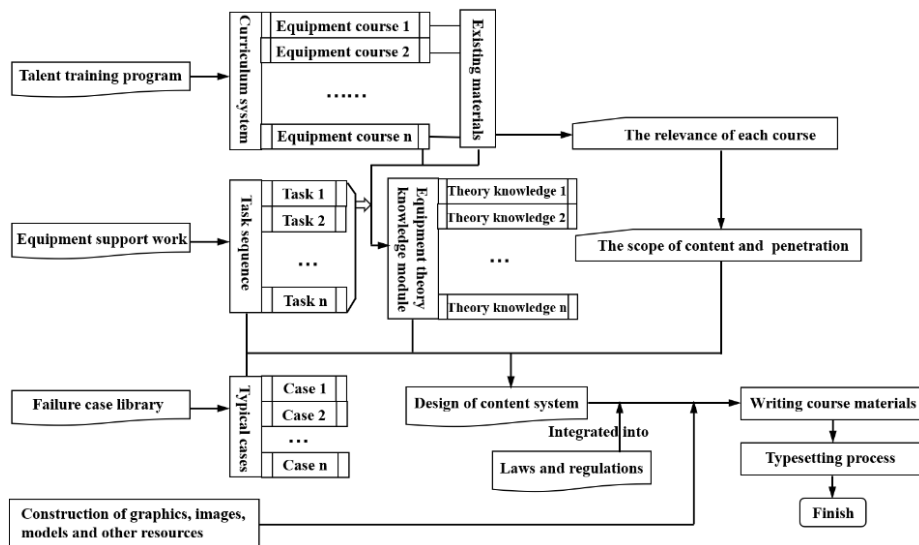


Figure 2 The construction process of course materials integrating theory and practice based on mission support.

4 TEXTBOOK CONSTRUCTION PROCESS

The theory-practice integration textbook based on mission support is reformed on the basis of the original ordinary equipment textbook. According to the strategy of textbook construction, the construction process can be roughly divided into four main stages, as shown in Figure 2.

4.1 Establishing connection between different equipment course materials of the same specialty

Considering the complex cross-linking relationship between various equipment in the same discipline, the maintenance support of one equipment is often related to several other equipment [3]. Therefore, in order to realize the systematization and systematization of all course materials of the major, we should first study all equipment courses in the major as a whole according to the vocational education training objectives. The course matrix is used to analyze the interaction between courses, and calculate the dependence index. And then determine the scope and extent of the content penetration of the subsequent equipment course materials into the forward-looking equipment course materials.

4.2 Establishing connection between practical tasks and equipment theory

We should comprehensively analyze the actual equipment support work process, divide the work process into stages in combination with the teaching characteristics and actual situation of colleges and universities, select key stages and typical stages, and

generate task sequence for project task-based professional course materials [4]. The sequence should basically cover the main maintenance and support tasks of equipment in terms of scope, conform to the actual work process in terms of sequence, and meet the post capacity requirements in terms of training objectives.

The analysis of the range of equipment theoretical knowledge associated with each task should be thought about with LSTM. And we also should focus on the theoretical basis that must be possessed in advance for task development, and the equipment theory that can be understood through task practice or corresponding to the task maintenance range, modularize the systematic equipment theory of the original textbook, form multiple knowledge modules, and associate them to each practical task. According to the talent training objectives, in combination with the cognitive level of teaching objects, the scope and depth of each knowledge module are optimized and adjusted according to the principle of "sufficiency first and appropriate depth", so as to complete the establishment of the relationship between practical tasks and equipment theory.

4.3 Selecting typical cases to complete the design of teaching material content system

We should build a case base for equipment faults and malfunctions, study the cases directly related to specific equipment in the case base, and extract those cases that support practical tasks and equipment theory. We should also insert the selected typical cases into the appropriate position of the textbook. The selection of the position should be based on the practical task closest to the case, or the equipment theory knowledge module supporting the analysis and elimination of the case. With the help of the just completed practical training and accepted

equipment theory, students can understand the process of the case, analyze the troubleshooting methods, and restrict their own operation behavior. So far, the design of teaching material content system has been basically completed.

4.4 Completing Information resource construction and implementing textbook compilation

Compiling high-quality vocational education equipment course materials and supporting resources construction is an important basic work, mainly including task practice image acquisition, equipment 3D model production, necessary equipment internal structure drawing, etc. According to the design idea of the textbook content system, the operating procedures and safety regulations will be introduced into the textbook in the form of points, focusing on the prompt and warning of the key operations in the process of practical tasks. Therefore, the extraction and arrangement of such

contents can also be taken as a part of the resource construction. The quality of resource construction and its ability to express the task process and equipment theory are directly related to the accuracy and vividness of the content of the textbook, and also greatly affect the difficulty of reading and understanding the textbook.

5 PRACTICAL APPLICATION OF TEACHING MATERIAL CONSTRUCTION

Based on the theoretical research of teaching material construction, five integrated course materials of equipment courses have been compiled and put into use in teaching. In order to understand students' attitudes and views towards the course materials, a total of 184 students from Grade 2020 and Grade 2021 were surveyed by questionnaire. The questions are shown in Table 1. Likert scale was used in the questionnaire, which could be divided into five categories: "completely agree", "quite agree", "generally agree", "not quite agree" and "not at all agree". It could reflect the respondents' satisfaction with the course materials.

Table 1: Questionnaire questions

NO.	1	2	3	4
Question	Is the depth of knowledge of equipment principles in the course materials appropriate?	Is the course materials close to the actual operation?	Satisfaction with the content arrangement and attractiveness of the course materials.	Satisfaction with the format and standardization of the course materials.
NO.	5	6	7	8
Question	Do the readings and cases as well as regulations help to expand your knowledge?	Does teaching material have guiding effect on developing practical operation?	Is it helpful to improve the style of operation?	Did you consult the course materials and solve any problems you encountered during the learning process?
NO.	9	10	11	12
Question	Do you take the initiative to use the course materials before and after class to study and complete various tasks?	Do you have the desire to actively read the course materials?	Satisfaction with the overall use of the course materials.	Are you willing to bring the material to work and keep it as study material?

A total of 175 survey reports were collected in this questionnaire survey, and the data statistics are shown in Figure 3. According to the first four items, students are satisfied with the arrangement of knowledge content, format and standardization of the textbook. And they think that the arrangement of content is clear, the format is novel, and the integration of principle and practice is easy to understand. They like the reading materials and case studies after each task. This arrangement stimulates their interest in independent learning and desire to solve problems, and promotes the development of safety awareness, which is helpful for the cultivation of operating style. Before and after class, students are willing to take the initiative to refer to the course materials to carry out practical operation and solve the problems encountered in learning. On the whole, the course material conforms to the cognitive rules of students and can highlight the characteristics of professional guarantee. Students have a high degree of satisfaction with the course materials, and most of them are willing to take the course materials to their working places for further study after graduation.

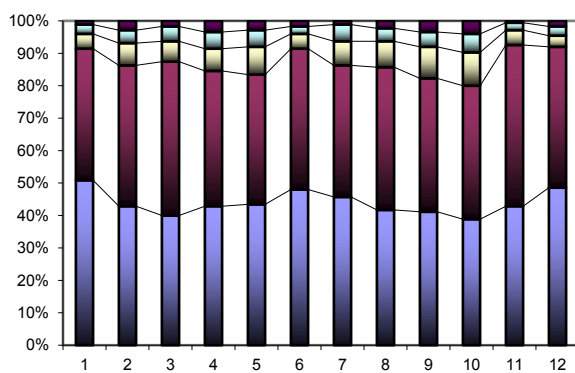


Figure 3: Statistics of questionnaire data

In addition, in the course of teaching practice, the integrated course materials based on mission supports have successively completed the integrated teaching design of science and practice, and built a set of high-quality micro lessons, practical training guidance cards, and question banks more suitable for post ability level test. The construction of the course materials has significantly improved the teaching quality of the courses. The course materials have been sent to different institutions for advice, all giving high evaluation. They think that the course materials can meet the demand of professional posts with ensuring the mission as clues as well as task-like layout. It not only has detailed operation steps and precautions, but also the study of regulations and typical fault case analysis. It is suitable for different levels of personnel, making it a classic teaching material of work standardization and refinement. It is also a much-needed reference book for daily work.

6 CONCLUSION

Based on mission support, the integrated course materials of theory and practice are closely related to daily training. It takes practical support missions as the main line, reasonably distributing mission supports, equipment knowledge, rules and regulations, failure cases, etc., into support tasks. Situational approach can avoid the disconnection between college learning and practice, so that students know the facts as well as the truth behind them, and quickly improve their post ability [5]. Teaching practice has proved that both students and institutions have given affirmation to this design concept of course materials and improved the teaching effect.

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