



# Development and Application of First-Class Online Courses Based on Job Competencies

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**Abstract.** In view of the problems of insufficient “job service” and “vocational guidance” in the construction of online courses of military vocational education, this paper proposes a curriculum development method based on job competency. Because of the relevant standards of national and military online course construction, it constructs a three-stage course development model based on post ability, and proposes a four-link course content development process. The article takes the national excellent online course “Communication Line Construction Safety” as an example to verify the example finally. The application result of the course shows that the method is feasible and effective. It will provide some guidance and reference for military vocational education on-line course construction.

**Keywords:** Military Vocational Education · Online courses · Occupation ability · Communication line

## 1 Introduction

It is an important strategic decision of our country to vigorously develop military vocational education with the characteristics of our army. The report of the 19th National Congress of the Communist Party of China reiterated that we should strengthen the construction of the military personnel training system to provide a strong talent guarantee for achieving the goal of building a strong military and building a world-class military [1]. At present, the top-level design of military vocational education has been initially completed. However, there are still many challenges to realize the high-quality development of online courses of military vocational education, mainly in the following aspects. First, the pertinence, accuracy and effectiveness of curriculum resource construction are not enough. The precise connection between the supply and demand of military vocational education is insufficient. Second, Although the military vocational education platform has launched more than 3000 courses, the educational resources are far from meeting the diversified and personalized learning needs of military personnel in terms of quantity and quality. The curriculum design “post service” and “career guidance” are not enough. The course content and position are not “built as needed” and “born as needed” [2]. Third, Although the provisional measures for curriculum construction put forward the guiding ideology and basic principles that should be followed in the construction

of online resources in the macro policy, the theoretical and methodological provisions for curriculum construction are relatively few [3]. So, how to build the online course of military vocational education in practice? What is the specific implementation path? This is the question that this article explores.

## **2 Standards for Online Course Construction**

### **2.1 GB/T36642-2018 National Standard**

In order to solve many problems such as imperfect cross-platform evaluation system of online courses, limited resource migration, insufficient course resource sharing and interoperability between different platforms, GB/T36642-2018 provides online courses and evaluation schemes. It provides a technical standard guarantee for the sharing of educational resources of online courses and the promotion of educational equity, and is also applicable to the construction and evaluation of different types of courses. The curriculum evaluation indicators are mainly composed of four indicators: curriculum information perfection, curriculum construction and maintenance, curriculum design, and curriculum participation. The dimensions and sub-items of each indicator are shown in Table 1. The main feature of the evaluation standard of the course construction is to use the analytic hierarchy process to evaluate. It is mainly based on objective evaluation, supplemented by expert evaluation. According to the data analysis and statistics of the online education platform, experts conduct course evaluation under the support of data.

### **2.2 Military Curriculum Construction Standards**

In order to strengthen the construction of learning resources in military vocational education, the military department has drafted the Interim Measures for the Construction of Military Vocational Education Courses. It mainly includes basic positioning, functional division, organization and implementation, and curriculum evaluation. The course evaluation criteria are shown in Table 2. The characteristics of this evaluation standard are mainly based on manual subjective evaluation and lack of objective evaluation [4].

## **3 Curriculum Design Method of Job Competence**

In addition to the construction of online courses of military vocational education in accordance with the relevant standards of the country and the army, the particularity of the users should also be considered. The fundamental purpose of military vocational education is to carry out post capacity improvement and knowledge expansion and update training. Through learning, the knowledge structure of military personnel was updated in a timely manner, and their ability to perform their duties and professional quality were comprehensively improved. Military vocational education can effectively solve the contradiction between the increasing learning needs of officers and soldiers and the insufficient learning resources. Therefore, the online curriculum of military vocational education urgently needs to break through the traditional concept of curriculum content design. The construction of curriculum resources should emphasize pertinence, accuracy,

**Table 1.** Main dimensions and sub-items of the online course evaluation plan

Evaluation dimension	sub option	Item Recommendation Weight
Completeness of course information (10%)	Required element perfection	80%
	Optional element completeness	20%
Course construction and maintenance (10%)	Course Announcement Information Score	50%
	Course Discussion Forum Teacher Assistant Contribution	40%
	Maintenance of other resources	10%
Curriculum Design (40%)	Reasonable setting of the duration of learning knowledge points	25%
	The duration of the learning activity setting is consistent with learner engagement	25%
	Are more difficult learning activities adequately engaged?	25%
	Number of participants in learning activities	25%
Course Participation (40%)	People engagement	20%
	Video engagement	20%
	Exercise Participation	20%
	Discussion board participation	20%
	Exam Participation	20%

and effectiveness, and enhance the “gold content”, “new content” and “war content”. The curriculum system of military vocational education should be effectively connected with the practical needs of the army and the requirements of post-performance. The curriculum system of military vocational education should be effectively connected with the practical needs of the army and the requirements of post-performance.

### 3.1 Job Competency Model

The online course development and design models mainly include: the online course structure model based on the ecological view, the information processing model of the online course, and the course design model based on the post ability. The course design model based on job competency is developed because of Capability based Planning (CBP) method. CBP was first proposed by the United States Defence Capability Research Group of the US Department of defence. Its main purpose is to implement a strategic

**Table 2.** Online Course Evaluation Criteria

Index	Secondary indicators	Content	Score
Teaching objectives	Target setting	The course insists on teaching and fighting, which is in line with the goal of military vocational education.	15
	General idea	The principles and ideas of curriculum construction are clear, and the learning effect and ability level that should be achieved through learning are accurate and specific.	15
Teaching content	Topic selection requirements	The content and topic selection are closely related to the needs of job performance ability improvement and knowledge expansion and updating.	15
	Content design	The content design reflects the frontier of military technology development and absorbs the latest innovations. The curriculum is advanced and forward-looking.	10
	Framework	The frame structure presents a complete unit of knowledge, with prominent emphasis and refined content.	10
Teaching method	Instructional Design	Teaching methods and strategies are appropriate, conform to cognitive laws, innovative, interesting, and inspiring.	10
	Teacher teaching	The thinking is clear, the expression is accurate, the explanation is thorough, the key points are prominent, the language is vivid, the expression is clear, easy to understand, and the appeal is strong.	10

*(continued)*

**Table 2.** (continued)

Index	Secondary indicators	Content	Score
Course making	Education resources	The multimedia courseware is beautifully produced, the animation and simulation performance are reasonable, the graphics and characters are properly applied, and the visibility is strong.	10
	Editing	The video, audio, sound and picture are synchronized, the lens connection is reasonable and smooth, the sound is clear, and the text is eye-catching.	5
Innovative		The course is innovative in content, video, interaction and more.	5

transformation with joint operations as the core, replacing the original “threat-based” model developed for specific objects and situations [5]. From the characteristics of military vocational education online courses, the idea based on capability planning is especially suitable for the development of online courses. The specific approach can be divided into three stages, as shown in Fig. 1. The first stage is to prepare a job description. The army is responsible for sorting out the requirements of post competence and quality, clarifying the attributes, professional fields, professional qualifications, and development direction of the post personnel, and forming the analysis report of the post field. The second stage is to formulate the post ability index system. Combined with the analysis report, military academies analyse the capacity requirements of these posts, develop specific professional post capacity index system, and clarify the requirements for knowledge, skills, and experience in the field of posts. The third stage is to guide the curriculum construction of military vocational education. According to the established post competency standards, the course construction team refined the course training objectives, built online courses and innovated the course construction mode.

### 3.2 Course Content Development

Traditional online course content development adopts relatively independent modular organization. It takes knowledge points as the basic teaching elements, and constructs the curriculum content according to the three levels of “teaching unit → lecture → knowledge points”. The biggest disadvantage of this method is that it overemphasizes the integrity of course content and ignores the limitations of fragmented learning of online courses [6]. This paper proposes an online course content development method based on the post competency model, including four links: “post standards → learning objectives → learning outcomes → course content”. The curriculum design is guided

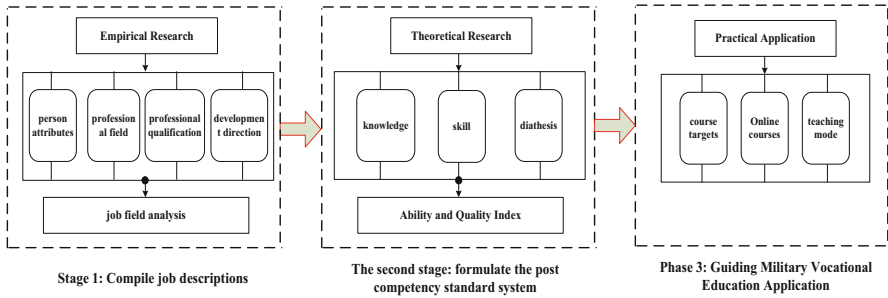


Fig. 1. Job competency standard model

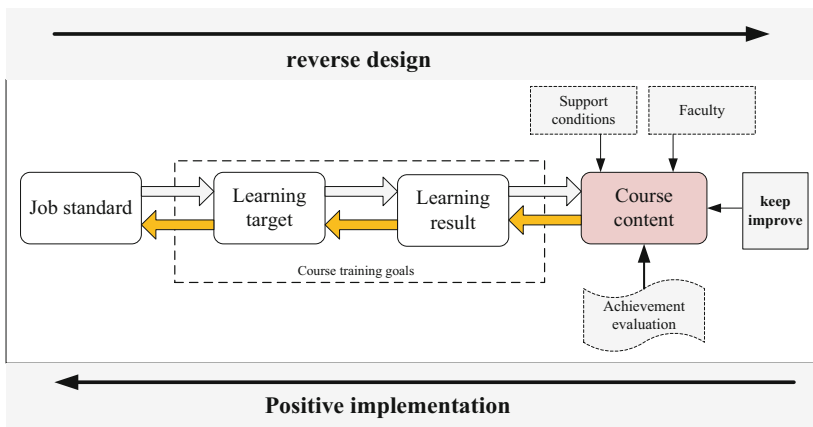


Fig. 2. Job competency standard model

by the post ability goal, establishes the course learning goal, refines the learning results, and determines the course content. This method realizes the closed loop of curriculum development of “reverse design, forward implementation and continuous improvement”. It clarifies the contribution of the course to achieving the expected learning outcomes and ensures the orientation and practicality of the course content. The development process model is shown in Fig. 2.

## 4 Online Course Development Practice

### 4.1 Formulate Job Competency Standards

According to the standard model of post ability, the research team has gone to the posts related to the communication lines of the army for many times. The experts of the joint force, focusing on the job requirements, sorted out the actual job process and project work procedures corresponding to the communication line project, and summarized 9 different typical job contents. A three-level hierarchical and progressive communication line engineering capability standard system has been constructed based on the formation

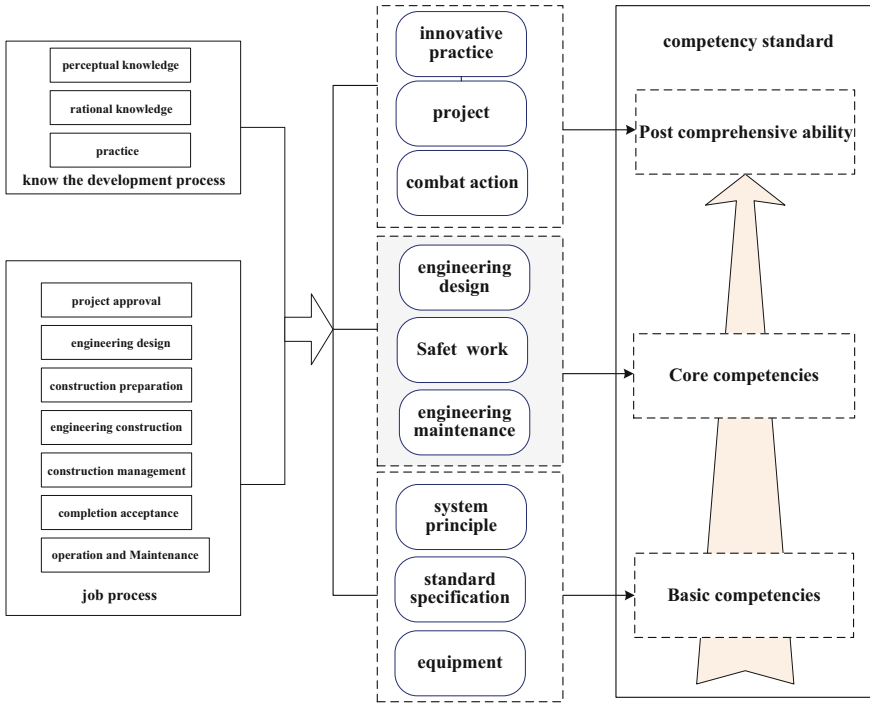
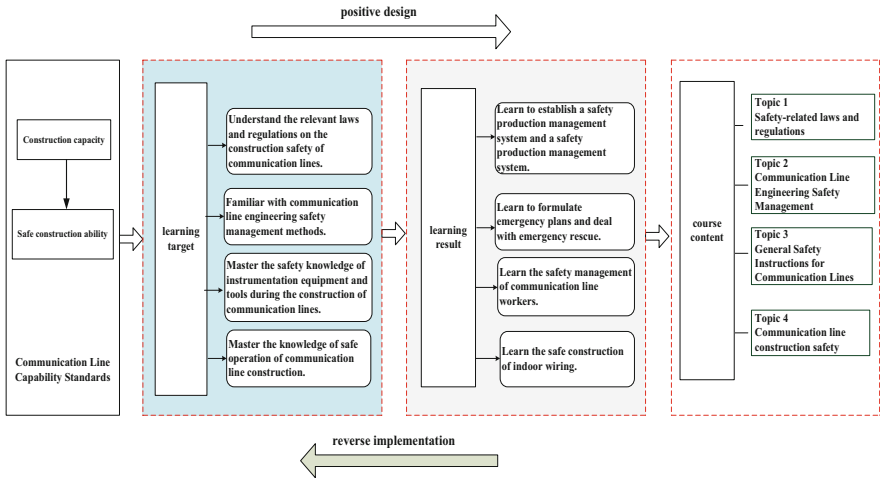


Fig. 3. Job competency standard model

of basic post competencies, the training of post core competencies as the core, and the improvement of post comprehensive competencies as the goal, as shown in Fig. 3.

### 4.2 Online Course Content Development

The online course “Communication Line Construction Safety” is developed according to the course content development model, as shown in Fig. 4. The first is to determine the standard of communication line capability. The communication line capability standard system includes the second-level indicator “construction capability”, and the construction capability includes the third-level indicator “safe construction capability”, which directly corresponds to the curriculum development. The second is to clarify the learning objectives. Through the course study, students can understand the relevant laws and regulations on the construction safety of communication lines. Students will be familiar with the safety management methods of communication line engineering, master the safety of equipment, instruments, and tools during the construction of communication line, and master the safety operation knowledge of communication line construction. The third is to achieve learning results. Through the course study, the students learned to establish the safety production management system and safety production management system for the construction of communication lines, to develop the emergency plan for the construction of communication lines and the emergency rescue methods for accidents, and to learn the safe construction of indoor communication lines. The fourth is



**Fig. 4.** Development of the course content of "Communication Line Construction Safety"

the development of thematic curriculum content. Students study 4 themes in order to complete certain learning outcomes.

The course content system follows the line engineering construction procedures and has complete elements. The content mainly includes four topics, including safety-related laws and regulations, safety management of communication line engineering, general safety instructions for communication lines, and construction safety of communication lines. The course content construction has the following characteristics. First, it highlights practicality. The contents refer to the current national safety standards and specifications. Second, it emphasizes the progressiveness. The course introduces the latest engineering construction management regulations, policies related to civil-military integration, and emerging technologies for construction safety of optical cable lines. Third, it reflects the ideological and political nature. The ideological and political resources and elements of the curriculum are organically integrated with the curriculum content.

## 5 Conclusions

The course construction achievements not only enrich the online training resources of communication line specialty, but also achieve good teaching benefits. Since the course was launched, there have been more than 8000 registered learners and 6000 interactions. The effect of course construction was highly praised by the registered learning officers and soldiers. The effect of course construction was highly praised by the registered learning officers and soldiers. The course construction achievements have also been widely applied in the teaching practice of offline courses such as "Communication Engineering Design Training Course". According to the characteristics of military vocational education, combined with the relevant standards of national and military online courses, this paper comprehensively uses theoretical research, empirical research, and other methods to build an online course construction model based on post capabilities. This method



carries out reverse design and positive realization of online course content according to learning output. This construction method enhances the pertinence and operability of the course construction, and realizes the progressive training of students' abilities. We hope that the online curriculum development method based on post ability can be continuously improved and optimized in future practice.

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