



# Research on the Talent Cultivation Model of Engineering Management Major under the Background of Intelligent Construction and New Engineering Disciplines

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**Abstract.** In order to implement the relevant spirit of the Ministry of Education of the People's Republic of China and adapt to the social demands of "new engineering" construction and intelligent construction, this paper uses methods such as literature research and questionnaires to analyze the existing problems in the cultivation of engineering management professionals, the situation of the employment market, and the talent demands of enterprises. Combined with the feedback from already employed students, it analyzes the implementation strategies for talent cultivation, providing a basis for formulating the talent cultivation plan for the engineering management major of this school.

**Keywords:** New Engineering, Intelligent Construction, Engineering Management, Talent Cultivation.

## 1 Introduction

Under the dual background of "intelligent construction" and "new engineering", the future emerging industries and new economy need high-quality composite talents with strong practical ability, strong innovation ability and competitiveness [1]. To this end, it is necessary to explore the talent training model for engineering management majors from the perspectives of national policies, industry development, enterprise needs and student feedback, and propose development paths from the perspectives of talent training objectives, curriculum system structure and teacher team development, so as to improve the digital, intelligent and collaborative ability of engineering management majors to meet the needs of intelligent construction and new engineering background.

## 2 Current Situation of Engineering Management Personnel Training

Under the background of intelligent construction and new engineering, engineering management talents should not only master traditional engineering knowledge, but

also have cutting-edge skills such as BIM technology, big data analysis and intelligent construction management. As a result of the development of the industry, traditional engineering management talents cannot meet the needs in terms of digital and intelligent skills [2].

## **2.1 Limitations of the Traditional Model**

### **(1) Training objectives lag behind the industry**

The major of engineering management is a complex and multi-specialty interdisciplinary major, and the determination of training objectives needs to be based on the development of the industry. At present, the training goals and programs of many universities refer to the traditional model and are divorced from the actual market and enterprise needs, which limits students' vision and career development [3]. Many engineering management personnel training only pay attention to the teaching of professional knowledge, but ignore the training of practical operation ability, professional quality and innovation ability, resulting in the lack of core competitiveness after students enter the enterprise.

### **(2) The structure of teaching staff is unreasonable**

It is understood that some teachers of the engineering management major lack practical work experience in the field of engineering management, and the teaching content is not forward-looking and practical. In addition, in the aspect of innovation and entrepreneurship education, teachers lack relevant practical experience and teaching ability, and it is difficult to deeply integrate innovation and entrepreneurship education with professional courses. With the development of intelligence, AI and other fields, intelligent construction and new engineering involve multidisciplinary knowledge, which requires high interdisciplinary teaching ability of teachers. However, at present, the training and practice opportunities for college teachers in this field are limited, and the teaching content and methods of teachers are relatively simple, which makes it difficult to meet the needs of engineering management talents for social and emerging things.

## **2.2 Shortcomings of the Existing Model**

### **(1) The curriculum system is unreasonable**

According to the survey feedback, some courses of engineering management are not closely combined with the actual work needs of engineering management, such as "Accounting" and "Financial Management" and other courses are not focused on the specific application of engineering construction. There is a phenomenon of overlapping teaching content between different courses, For example, the contents of "Engineering project Management" and "Engineering cost Management" and "Bidding and Contract management" cross over, leading to the waste of teaching resources; The lack of guidance on intelligent construction, BIM technology, prefabricated building and other cutting-edge technologies in the curriculum system is not conducive to students' career growth; The curriculum mainly focuses on theoretical teaching, while the practical teaching links are weak.

## **(2) The practice teaching link is weak**

Engineering management is a very practical major, students should reflect the application of knowledge and practice. However, many practical teachers only pay attention to the cultivation of theoretical knowledge, but ignore the practical teaching. The practice link is loose, the correlation between the practice content and the engineering construction project management is low, and part of the practice is just a formality. There are difficulties in the construction of off-campus practice bases in some schools, and the practical teaching conditions are limited, so it is difficult to find projects that are really suitable for engineering management practice. Teachers' assessment and evaluation of students' practical effects lack of scientificity and flexibility, and it is difficult to effectively evaluate the improvement of students' practical ability. The practice teaching link is weak, and the practice content fails to effectively integrate intelligence, information and digitalization into the practice operation and assessment link.

## **3 Countermeasures and Suggestions on the Training Mode of Engineering Management Personnel**

New engineering construction emphasizes interdisciplinary integration to cultivate innovative and compound talents. As an important direction of new engineering, intelligent construction puts forward new requirements for engineering management. In order to adapt to this trend, the engineering management major needs to optimize the curriculum system and cultivate engineering management talents with intelligent construction knowledge and skills and multi-disciplinary integration.

### **3.1 Build a Diversified Talent Training Model**

First of all, according to the development orientation, discipline advantages and industry needs of colleges and universities, it is necessary to clarify the talent training direction of engineering management. For example, engineering universities can focus on the characteristics of engineering technology and train professionals in Bridges, roads, water conservancy and other fields. Economic and management colleges can highlight the characteristics of engineering financial management, engineering economic management, etc. Application-oriented colleges and universities should lay emphasis on the cultivation of students' practical operation ability and the setting of practical courses.

Secondly, differentiated development should be carried out in the determination of the objectives of the talent training program, and the curriculum system should be optimized to meet the characteristics of the integration and cross of engineering management.

### 3.2 Optimize the Curriculum System

Under the background of intelligent construction and new engineering, the training of engineering management professionals needs to optimize the curriculum system, so it is necessary to pay attention to demand-oriented training of engineering management talents in line with the development of the industry, integrate civil engineering, computer science, data science and other disciplines, build an interdisciplinary curriculum system, and strengthen practical teaching [4]. Enhance students' ability to innovate and solve practical problems; Moreover, the curriculum system should be adjusted according to the dynamic development of the industry to ensure its advanced nature and practicality. Specific operations are as follows:

#### (1) Add intelligent construction core courses

In the context of the development of the industry and the needs of enterprises, schools should actively modify the training program for engineering management professionals and add core courses of intelligent construction to the curriculum. For example: Introduction to Intelligent construction: introduces the concept, technology and application of intelligent construction. BIM technology and application: Learn the principle of BIM technology and its application in project management. Intelligent construction technology: covering intelligent construction equipment, robots, 3D printing and other technologies. Smart site management: Introduces the construction, management and operation of smart site.

#### (2) Reforming the traditional curriculum

The traditional professional core courses of engineering management should be reformed to meet the needs of The Times: engineering project management integrates BIM, big data and other technologies to improve the intelligent level of project management, while interspersing the knowledge of law, technology, economy and other multidisciplinary integration. Engineering economics increases the economic evaluation content of intelligent construction projects. Project contract management discusses the intelligent construction contract model and risk management. Construction technology introduction of smart chemical industry, AI simulation construction, BIM technology. It is also necessary to build a curriculum system covering economics, management, law, technology, information and other disciplines, highlighting the deep integration of interdisciplinary disciplines. For example, the "information" module is added to introduce cutting-edge knowledge such as digitalization, informatization and intelligence.

#### (3) Strengthen the construction of practical courses and build an integrated platform

Due to the characteristics of the engineering management major and the needs of the industry and enterprises, attention must be paid to the improvement of students' practical ability [5]. School-enterprise cooperation and practice base construction: Establish a deep cooperation mechanism between schools and enterprises, and enhance students' practical ability through co-construction of practice bases and participation of enterprise tutors in teaching. If conditions permit, we will build an integrated platform of "production, university, research and innovation" and provide students with opportunities to practice innovation and entrepreneurship through the form of

simulated companies and double and innovation tutor studios. Actively hold or participate in a variety of engineering management practice activities, such as BIM design competition, digital building innovation application competition, smart city and intelligent construction competition, etc., to improve students' practical application ability.

### 3.3 Strengthen the Construction of Teaching Staff

By improving teacher quality, optimizing teacher structure, reforming teaching mode, strengthening scientific research ability, improving evaluation mechanism, deepening school-enterprise cooperation and promoting internationalization, the engineering management major can effectively strengthen the teaching staff under the background of intelligent construction and new engineering, adapt to the needs of the industry, and cultivate high-quality talents. Specific operations are shown in Table 1:

**Table 1.** The concrete operation table of strengthening the teaching staff

Operation entry	Specific content
Enhance teachers' professionalism	Learn emerging technologies such as artificial intelligence, big data, and the Internet of Things
	Support participation in smart building projects
Optimize the teaching staff structure	The introduction of international advanced concepts and technologies to broaden teachers' horizons
	Attract high-level talents with intelligent construction background
	Hire business experts as part-time teachers
Reform teaching mode	Establish tutorial system and support faculty team for scientific research projects
	Encourage teachers to use case teaching, project driven and other models to improve students' practical ability
	Use virtual reality, augmented reality and other technologies to teach
Strengthen scientific research capacity	According to the needs of intelligent construction, adjust the curriculum and add cutting-edge technology content
	Establish interdisciplinary research teams to promote research on intelligent construction
	Teachers are encouraged to apply for national, provincial and ministerial scientific research projects related to intelligent construction and new engineering to improve the level of scientific research
	Cooperate with enterprises and scientific research institutions that integrate intelligent construction and disciplines
Promote internationalization	Cooperate with internationally renowned universities to carry out joint training and scientific research projects
	Introducing international advanced courses and teaching materials
	Teachers are encouraged to attend international conferences

### 3.4 Improve the Evaluation System of Personnel Training

The major of engineering management should build a diversified, multi-dimensional and dynamic talent training and evaluation system, combine with intelligent tools and industry needs, and comprehensively evaluate students' theoretical knowledge, practical ability, innovation ability, professional quality and international ability. Through the scientific evaluation system, the continuous improvement of talent training quality is promoted to meet the needs of high-quality engineering management talents in the intelligent construction industry. For example: from teachers, enterprises, student self-assessment and mutual assessment, industry associations or certification bodies to conduct diversified evaluation; Pay attention to theoretical knowledge, practical ability, innovation ability, professional quality, teamwork, international ability and other aspects of evaluation; On the basis of process evaluation and result evaluation, students' learning files are added to record the learning process and realize dynamic tracking and comprehensive evaluation. At the same time, it can also use big data analysis, artificial intelligence assistance, virtual simulation evaluation and other tools for intelligent evaluation.

## 4 Conclusion

Under the background of intelligent construction and new engineering, there are both challenges and opportunities for the training of engineering management professionals. The training of engineering management professionals should be carried out through various ways, such as the determination of training programs, the construction of curriculum system, the training of teachers, and the improvement of practical ability, so as to meet the development of The Times and the needs of society.

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