

# Exploration and Practical Research on Cultivation of High-level Compound Talents of Master of Engineering Management (MEM) Based on the Concept of “Integration of Engineering and Literature”

Ruijia Yuan, Sihan Wang, Yingmiao Qian\*

*School of Management Science and Engineering, Anhui University of Finance & Economics,  
Bengbu, Anhui, China*

*\*Corresponding Author.*

**Abstracts :** The concept of “integration of engineering and literature” is an important path to cultivate high-quality master's degree talents in engineering management under the background of “Belt and Road”. This paper firstly researches the role of cultivating masters of engineering management under the concept of the integration of engineering and literature. Under the above premise, this paper puts forward the objectives of talent cultivation under the concept of integration of engineering and literature, and elaborates the specific content of each objective. Based on the cultivation objectives, this paper proposes four talent cultivation paths based on reconstructing the curriculum system, creating a dual-teacher teaching team, promoting the reform of teaching methods, and building a platform for school-enterprise cooperation. This study provides effective guidance for universities to cultivate engineering management masters with the ability of integrating engineering and liberal arts in the context of “Belt and Road”.

**Keywords:** Integration of Engineering and Literature; Engineering Management; Talent Cultivation; Belt And Road

## 1. Introduction

Liberal arts education aims to explain the historical and cultural development patterns of human society, showcasing the formation and evolution of production modes, lifestyles, and values. It profoundly influences the cultivation of personal character, aesthetic sensibility, social responsibility, and the establishment of correct worldviews, values, and perspectives on life. In recent years, higher education has taken serving major national strategies, such as the national

innovation-driven development, "Internet Plus," "Made in China 2025," and the "Belt and Road Initiative," as its starting point. The construction of the "New Liberal Arts" has become an important measure for higher education to respond to technological innovation, industrial revolution, and the new economy's demands on talent cultivation. It is also a critical objective for increasing cultural confidence and fostering engineering thinking in the new era. In addition, based on the national "Belt and Road" strategy, the international influence of Chinese enterprises undertaking construction projects under this initiative has been growing. There are numerous opportunities for cooperation on engineering projects with countries and regions along the Belt and Road. However, there is a shortage of management talent to serve the construction projects under the "Belt and Road" initiative. Even large enterprises such as China State Construction and China Railway are in urgent need of such talent. Cultivating engineering management talent to spread Chinese wisdom and culture along the "Belt and Road" is an urgent task. Using culture to educate and nurture individuals is the foundation of talent development. At the same time, as an important carrier of advanced socialist culture, one of the tasks of constructing the "New Liberal Arts" is to promote Chinese culture, tell Chinese stories, establish Chinese schools of thought, and express Chinese perspectives. Therefore, based on the concept of "integration of engineering and liberal arts" and rooted in the practice of the "Belt and Road" initiative, cultivating internationally-oriented and interdisciplinary engineering management professionals who can contribute Chinese wisdom and spread Chinese culture aligns with the new needs of the national economic development strategy. This approach

provides Chinese solutions for the "Belt and Road" construction and promotes Chinese culture worldwide.

## **2. The Concept of "Integration of Engineering and Liberal Arts"**

The concept of integrating engineering and liberal arts can be traced back to 2017 when Shalem College in the United States first proposed the concept of "New Humanities." The aim was to inject comprehensive and interdisciplinary learning content into traditional humanities courses such as philosophy, literature, and languages through disciplinary reorganization, interdisciplinary intersections, and the integration of new technologies. China began to explore and implement this cutting-edge educational concept in 2018. The concept of integrating engineering and liberal arts, as a modern educational trend, advocates for the deep integration of engineering and technology with humanities and social sciences to cultivate interdisciplinary talents who possess a combination of knowledge and comprehensive abilities in both fields. This concept emphasizes breaking down the traditional boundaries between engineering and liberal arts through interdisciplinary integration, facilitating mutual permeation and complementarity of knowledge systems, thereby enhancing educational quality and effectiveness. The emergence and development of the concept of integrating engineering and liberal arts signify a renewal and challenge to traditional educational models.

## **3. Establishing Talent Cultivation Goals**

Existing research has proven that the complexity of contemporary engineering project management challenges necessitates that schools establish an integrated education model combining engineering and liberal arts to address complex construction scenarios (Jones C. S., 2024). At the same time, to effectively meet the new demands for engineering management talent under the Belt and Road Initiative, it is also of great significance to establish cultivation goals for high-level interdisciplinary MEM talents based on the educational concept of integrating engineering and liberal arts. As the Belt and Road Initiative advances, analyzing the changes in talent needs under this strategy becomes particularly important. Guided by the concept of "integration of engineering and liberal arts," this study aims to establish

cultivation goals for high-level interdisciplinary Master of Engineering Management talents. These goals focus on multiple dimensions, including knowledge, skills, mindset, and values, to promote Chinese wisdom and culture in the context of the Belt and Road Initiative.

Given the complexity of the Belt and Road construction and the diversity of cultural exchanges, the design of talent knowledge systems emphasizes the cross-disciplinary integration of engineering and liberal arts disciplines. This requires injecting rich knowledge of humanities and social sciences along with technical elements into traditional engineering knowledge systems to form a comprehensive knowledge structure. The competency framework encompasses abilities such as knowledge integration, teamwork, innovation, and adaptability to meet the dynamic project environments and international cooperation demands. In terms of mindset literacy, talents should be cultivated to break cognitive inertia, transcend disciplinary boundaries, and develop the ability to view problems from multiple perspectives, thereby forming a strong professional literacy. Additionally, emphasis should be placed on highlighting Chinese culture and patriotic sentiments in the dimension of values to cultivate engineering management professionals with an international perspective and national confidence. Specifically, the training objectives for Master of Engineering Management should focus on cultivating interdisciplinary talents with profound professional knowledge, outstanding cross-cultural communication skills, and innovative thinking. This aims to address the complex and ever-changing challenges and demands of the Belt and Road construction while contributing to the promotion of Chinese culture and values.

## **4. Exploring Paths for Talent Cultivation**

### **4.1 Curriculum System Reconstruction**

Reconstructing a curriculum system with interdisciplinary integration of engineering and liberal arts knowledge, and offering micro-credentials related to the Belt and Road construction. Specifically, restructuring the curriculum system can begin with the following approaches: Firstly, initiating interdisciplinary course designs that integrate core knowledge from engineering technology and management

studies. Offering interdisciplinary courses such as "Engineering Economics" and "Project Management and Leadership" to cultivate students' comprehensive abilities. The courses should cover the fundamental principles of engineering technology, the theory and methods of project management, as well as leadership and teamwork skills, aiming to enhance talent in managing project efficiency. Secondly, for the Belt and Road Initiative, international content should be introduced, including courses on international engineering law, international business communication, and cross-cultural management, to meet the international demands under the Belt and Road Initiative. These courses can help students understand the legal systems, business cultures, and communication methods of different countries and regions, enhancing their communication and management abilities in international engineering projects. Additionally, they cultivate talents capable of adapting project construction and management activities to local conditions. Finally, the practical skills of students should be strengthened. This can be achieved through internships, case studies, and simulated projects, allowing students to apply their knowledge in real-world scenarios and improve their problem-solving abilities. Particularly, in the teaching process, emphasis should be placed on construction management cases from different countries to enhance students' abilities to manage construction projects in diverse cultural contexts. Simultaneously, practical sessions can include arranging for students to conduct field visits and internships on engineering projects or participate in simulated projects both on and off-campus. This approach aims to develop their hands-on skills and project management capabilities.

#### **4.2 Building a Dual-Qualified Faculty Team**

Engage industry leaders and experts with experience in Belt and Road construction project management as part-time instructors to collaborate with university faculty in building a dual-qualified teaching team. Firstly, schools can hire teachers with engineering backgrounds and management experience. By introducing instructors who have extensive practical engineering experience and theoretical knowledge, they can incorporate real-world engineering cases into their teaching, thereby enhancing the practical and applicable aspects of

education. Additionally, these teachers can share their real-world engineering project experiences, aiming to provide students with insights that closely reflect actual work scenarios. Secondly, teachers with engineering backgrounds can compensate for the lack of practical experience among some university faculty, reducing instructional biases. Particularly, hiring teachers with overseas engineering experience can provide students with valuable insights into international construction management. Finally, fostering interdisciplinary skills among in-house faculty can reduce the cost of hiring external teachers. Encouraging faculty to participate in interdisciplinary research projects enhances their comprehensive abilities in both engineering technology and management, thereby improving their teaching and research capabilities. Teachers can continually update and expand their knowledge by attending academic conferences, participating in research projects, and undergoing technical training. Additionally, in-house faculty can delve into the study of the cultures, laws, and languages of countries along the Belt and Road, developing teaching models that integrate cultural understanding with project management. This approach will enhance students' comprehension of cross-border engineering management.

#### **4.3 Promoting Teaching Method Reform**

Utilizing overseas resources from enterprises, hiring overseas engineering management talents, and conducting blended learning through online platforms alongside traditional classroom teaching can be promoted. This approach offers flexible learning methods to meet individualized learning needs, while also providing access to a wealth of learning resources and platforms, allowing students to engage in autonomous learning according to their interests and requirements (Chakraborty et al., 2021). Firstly, promoting online teaching can reduce the cost of recruiting external teachers. Additionally, online teaching makes it easier to recruit more talented individuals. External talents can use remote teaching and live broadcasting to help students gain a deeper understanding of overseas construction characteristics while providing professional guidance. Online teaching also allows for the collection of more case studies for instruction. By analyzing real engineering cases, students can understand practical problems in engineering management, thus cultivating their

analytical and problem-solving abilities. Specifically, case-based teaching should integrate real-world situations from various countries to provide students with opportunities to tackle complex issues, thereby stimulating their critical thinking and innovation capabilities. Lastly, in the offline setting, involving students in actual engineering projects and fostering teamwork to address real-world problems can enhance students' practical management and teamwork abilities. Simulating potential issues that may arise in overseas projects and allowing students to address engineering management problems specific to different countries can provide students with in-depth exposure to overseas construction characteristics. By resolving these issues in advance, students can enhance their ability to tackle construction challenges in various countries effectively.

### 5. Conclusion

This article, based on the concept of integrating engineering and Literature, delves into the practical needs and ideals of such integration under the backdrop of the "Belt and Road" initiative. Currently, there is a noticeable shortage of talents in China who possess comprehensive abilities in both humanities and engineering. It is imperative to train master's students in engineering management based on the concept of integrating engineering and humanities. The article sets forth clear objectives for talent cultivation, while proposing a talent cultivation path based on these objectives. This path involves restructuring the curriculum framework, cultivating a teaching faculty adept in both disciplines, promoting teaching method reforms, and establishing collaborative platforms between universities and enterprises. These suggestions provide effective guidance for universities in nurturing high-caliber master's students in engineering management, particularly within the context of the "Belt and Road" era.

### Acknowledgments

This work was supported by Key Projects of Social Sciences in Anhui University Research

Programme (No. 2022AH050542, 2023AH050200); Provincial Quality Engineering Project for Universities in Anhui Province (No. 2022sx002, 2022zybj001, 2021sx005); Anhui Province New Era Education Quality Project (No. 2022jyjxggyj278, 2022shsjsfkc016); Supply and Demand Matching Employment Nurturing Programme, Department of Higher Education Students, Ministry of Education (No. 20220103153, 20230101784, 20230101785, 20230101786) , Anhui University of Finance and Economics Quality Engineering ( No. aczygz2022006, acjcxzz2022004) .

### References

- [1]Liu J, Cui Z, Feng Y, et al. Impact of culture differences on performance of international construction joint ventures: the moderating role of conflict management[J]. *Engineering, Construction and Architectural Management*, 2020, 27(9): 2353-2377.
- [2]Chen G, Li X, Zhang X, et al. Develo\*\* a talent training model related to chemical process safety based on interdisciplinary education in China[J]. *Education for Chemical Engineers*, 2021, 34: 115-126.
- [3]Van den Beemt A, MacLeod M, Van der Veen J, et al. Interdisciplinary engineering education: A review of vision, teaching, and support[J]. *Journal of engineering education*, 2020, 109(3): 508-555.
- [4] Jones C S. Designing an interdisciplinary course: case study of an interdisciplinary project combining marketing research, engineering, and media arts[J]. *Marketing Education Review*, 2024, 34(2): 144-152.
- [5] Chakraborty P, Mittal P, Gupta M S, et al. Opinion of students on online education during the COVID-19 pandemic[J]. *Human Behavior and Emerging Technologies*, 2021, 3(3): 357-365.
- [6] Li D. Construction of school-enterprise cooperation practice teaching system under the big data internet of things industry collaborative innovation platform[J]. *Computational Intelligence and Neuroscience*, 2022.