

Research on curriculum teaching team building under the background of project-based teaching reform

Guangmei Hai*, Shanguo Zhao, Fangxia Sun

Jiangsu Maritime Institute, Nanjing, China

**Corresponding author: hgm_jshs@126.com*

Keywords: Teaching mode; Project-based; curriculum teaching team; Intelligent building engineering technology

Abstract: In recent years, the state has issued a series of policy documents on vocational education reform, in which it has repeatedly mentioned innovative teaching models and methods to improve the quality of class teaching. Combined with the project-based teaching reform that the institute is vigorously promoting, the research group has studied and practiced the application of the project-based teaching mode based on modules in the core course of building intelligent engineering technology “Security and Prevention Technology”, summarized the measures and achievements of the construction of the curriculum teaching team, and believed that the modular teacher team is the key to the project-based teaching reform, close and in-depth school-enterprise cooperation is the prerequisite for the normal operation of the teaching team, and the support of national and institute policies and systems at all levels is the guarantee for the growth and development of the teacher team.

1. Introduction

In October 2021, “the Opinions on Promoting the High-quality Development of Modern Vocational Education” issued by the General Office of the CPC Central Committee and The General Office of the State Council mentioned that “5. Deepen education and teaching reform” and “14. Innovate teaching modes and methods.” “Carry out project-based teaching, situational teaching and modular teaching, promote the deep integration of modern information technology with education and teaching, and improve the quality of class teaching.” In the notice of the Ministry of Education on the issuance of “the National Vocational College Teachers’ Teaching Innovation Team Construction Plan” in 2019, it is mentioned that the specific construction goals are to comprehensively improve the ability of teachers to carry out teaching, training and evaluation in accordance with national professional standards and teaching standards, and fully implement the modular teaching model of teachers’ division of labor and cooperation. In the construction task, “(4) Innovate the modular teaching mode of team cooperation.” “Carry out national team teaching reform research, innovate modular teaching mode, break the traditional model of discipline teaching, explore new teaching methods such as ‘action-oriented’ teaching, project-oriented teaching, scenario-based teaching, and process-oriented teaching, and support each teacher to form a distinctive teaching style.”

Combining with the project-based teaching reform carried out by Jiangsu Maritime Institute, the research group has carried out research on the construction of teacher team in the reform.

2. Project-based teaching connotation based on module

There are two forms of modular teaching. MES (Modules of Employable Skills) is a teaching mode that focuses on on-site teaching and takes skills training as its core, which was researched and developed by the International Labor Organization in the early 1970s. It determines modules based on post tasks and takes the completion program of actual post work in a certain occupation as the main line, which can be called “task modules” [1]. CBE (Competency Based Education), which is mainly represented by Canada and the United States. It determines the modules based on the executive abilities and determines the teaching main line based on the cognitive abilities and activity abilities engaged in a certain occupation. It can be called “ability modules”.

MES starts from the work specification of the specific job, and focuses on the work ability of the job. Starting from the general rules and needs of the profession, CBE focuses on the basic general abilities of the profession. MES lacks the teaching and learning of systematic knowledge, which is suitable for skill training and not suitable for school education and teaching. CBE is based on the practical abilities required for the implementation of work tasks and abstracts it into a theory, ignoring the docking with the work process and not having strong adaptability to the position.

The modular project-based teaching makes full use of the teaching environment of the school, integrates various online and offline resources, carries out project-based design of teaching content, and cultivates students' vocational work abilities.

3. Overview of the teaching team of "Security and Prevention Technology" course

“Security and Prevention Technology” is the core compulsory course of building intelligent engineering technology major, which is opened in the first semester of sophomore year. It is a practical engineering application-oriented course. It is a compulsory subsystem in the national vocational skill standard - the assessment requirements of intelligent building administrators, and its teaching content is an important support to achieve the goal of professional personnel training. According to the talent training program, curriculum standards, national and industry standards, professional standards, intelligent building administrator national industry vocational skills competition standards, determine the teaching objectives of the course.

This course used to adopt the traditional teaching mode, mainly classroom teaching equipment principle and system function, combined with experimental practical training equipment to carry out on-site teaching. As the learning content is related to the actual engineering project but not closely enough, students are not clear about the requirements of vocational duties and skills, the knowledge and skills mastered at a certain stage will be forgotten soon, the ability of data collection, screening and integration needs to be improved, and the ability of practical ability and engineering application transfer of knowledge and skills is weak.

The teaching team consists of full-time teachers and enterprise technicians. Full-time teachers are 1-2 members who teach this course and are the main undertakers of related work such as course teaching. Enterprise technicians provide engineering and technical information, communicate with full-time teachers on professional issues, and generally do not contact with students directly. The team structure is not perfect, and the form and content of cooperation are relatively simple, which does not give full play to the advantages of the university and enterprise.

4. Measures and effects of the teaching team building in project-based teaching reform

4.1 Composition of the teaching team

Teachers are the foundation of vocational education reform. In the critical period of educational

transformation and development in the new era, as the leading force in education and teaching, the quality of teachers directly affects the quality of personnel training^[2]. Project-based teaching is a learner-centered curriculum model and teaching model. For teachers, subject knowledge should be transformed into project-based learning based on learner characteristics, learning objectives and learning content, and subject knowledge-centered teaching mode should be transformed into project-centered teaching mode, which is of great significance and value for curriculum development ^[3].

This requires teachers to not only understand the cognitive characteristics of students, but also be familiar with the specific requirements of engineering projects and corporate positions. Full-time teachers are more familiar with the former, and enterprise technicians are better at the latter. However, in the design of teaching projects, in addition to full and in-depth communication between full-time teachers and enterprise technicians, in order to achieve teaching goals, enterprise technicians need to be directly involved in specific practical teaching, and industry experts are also needed to give macro guidance.

In order to comprehensively promote the ideological and political construction of the curriculum, guide the values in the knowledge transfer and ability training, and help students to shape the correct world outlook, life outlook and values, ideological and political teachers need to be included in the teaching team.

Relying on the close school-enterprise cooperation relationship, the teaching team integrates the forces of intelligent building industry, intelligent building enterprises, schools and other parties to build a structured teaching team including experts, enterprise technicians, professional teachers, ideological and political teachers. Team members have their own expertise, prepare lessons collectively, give full play to their own advantages, and take charge of different teaching contents, so as to promote the smooth realization of the teaching goals of moral cultivation and technical training. At the same time, enterprise technical experts bring the latest technology and resources to the teaching, constantly expand the project case base, introduce new technologies, new processes, new systems. The composition of the modular teaching team and their respective specialties are shown in Figure 1.

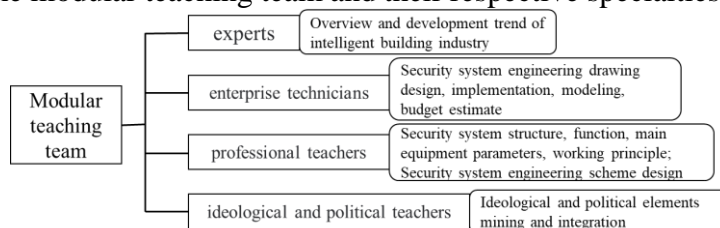


Figure 1: Modular teaching team and their expertise

4.2 Operation guarantee of the teaching team

To build the above teaching team, it is necessary to establish smooth and efficient communication channels between secondary colleges and between schools and enterprises, which requires the guarantee of relevant policies and mechanisms.

(1) Policy guarantee

The “National Vocational Education Reform implementation Plan” clearly requires that “industry enterprises should be guided to deeply participate in the training of technical skills, promote vocational colleges to strengthen professional construction, deepen curriculum reform, enhance practical training content, improve the level of teachers, and comprehensively improve the quality of education and teaching.” “Explore the establishment of a high-level, structured teacher teaching innovation team, teachers work together to carry out modular teaching.”

The College has a relatively comprehensive policy to promote the development of teachers and teaching teams. Such as professional and technical qualification assessment work methods, faculty

continuing education management methods, full-time teacher enterprise practice management methods, enterprise part-time teachers management methods. These policies provide a strong guarantee for the work of the teaching team.

(2) Funding guarantee

The electrical automation major of our school is the second batch of national teacher education and teaching innovation construction team, which is supported by special funds. At the same time, the school and secondary colleges attach great importance to the construction of teaching teams, actively encourage teachers and teaching teams to carry out related activities and research, and relevant management departments actively provide supporting funds.

(3) Team guarantee

Although the members of the teaching team have different units and different strengths, relying on the close school-enterprise cooperation relationship over the years, the members have always had business contacts, communication has been relatively smooth, and deeper cooperation is also the result of joint efforts of all parties.

4.3 Effectiveness of the teaching team building

4.3.1 The project-based teaching reform has achieved remarkable results

Based on the OBE teaching concept and teaching content module, the teaching team combined with the characteristics of students, reorganized the course content and form^[3], designed the whole course content into a general project: Design and implementation of security and protection system of the building, with the campus building which is familiar to students as the object and the knowledge, skills and literacy of intelligent building security system engineering design and implementation as the main teaching objectives.

The total project includes six sub-projects: equipment LAN integrated wiring system design and implementation, video surveillance system design and implementation, intrusion alarm system design and implementation, access control system cognition and design, visitor intercom and electronic patrol system cognition and implementation, parking lot management system design and operation. Among them, the integrated wiring system is the basis of building intelligence, is the link between the system equipment or subsystems, and the other five items correspond to the five sub-systems of the security system. These six items also correspond to the six modules in the teaching content. The seventh module "Ideological and political education in the New era" is designed and integrated into the teaching of other modules.

With application as the goal, practice as the main line and ability as the center, the course content integrates ideological and political elements, takes the design and implementation of the security subsystem of a floor of the campus building of the project as the carrier, and gradually cultivates students' engineering application ability, teamwork spirit, vocational post ability and ideological and political accomplishment through the implementation of tasks. The team built multi-dimensional evaluation indexes with equal emphasis on process and result, paying attention not only to the quality of design results, but also to students' professional quality and ideological and political quality, fully discovering students' bright spots and mobilizing students' enthusiasm for learning and practicing.

From the situation of resource access on the open online course platform, the modular project-based teaching mode has aroused students' enthusiasm for learning in class and out of class, and the participation rate, pass rate and head-up rate have been improved. From the classroom test and final examination, the teaching knowledge goal was achieved. According to the design results submitted by the same group before and after class, the design ability of students' security subsystem has been improved. Students' ability of information collection and resource integration has been improved, their language expression ability and summarization ability have been exercised, and their core

vocational skills have been improved. Through the design and implementation of each security subsystem, the students' teamwork spirit has been gradually enhanced, and good behavior habits have been formed, and quality goals have been achieved.

“Security and Prevention Technology” was identified as the first batch of batch of school-level project-based courses, and the full-time teachers successfully passed the school's first batch of personal teacher project-based ability assessment. At the same time, the experience of project-based teaching reform has been applied to another professional course of intelligent building engineering technology, “Intelligent building System Design”, which has been recognized as the second batch of school-level project-based courses.

4.3.2 Rapid growth of team members

Judging from the feedback of all parties, the teaching team's teaching recognition and satisfaction have been significantly improved, and the teachers' teaching abilities have been enhanced. The title of course leader was successfully promoted to deputy senior, and the new teachers grew rapidly. One team member won the third prize in the 2023 Jiangsu Teaching Ability Competition, one team member guided students to win the provincial first prize in the 2023 “Internet+ Innovation and Entrepreneurship Competition”, and one team member won the first prize and one team member won the third prize in the 2023 Micro Class Competition of the institute.

In terms of teaching and scientific research, the team members have achieved fruitful results in the past two years. One of the team members has initiated the 2023 Basic Science (Natural science) research project in Jiangsu Provincial colleges and universities, one of the team members has initiated a school-level project, and two teachers are about to complete their project successfully.

5. Conclusions

The modular teacher team is the key to the success of project-based teaching reform, close and in-depth college-enterprise cooperation is the premise of the normal operation of the teaching team, and the support of national and college policies and systems at all levels is the guarantee of the growth and development of the teaching team.

Acknowledgement

Fund Project: This paper is the research result of the general project “Research on the Construction of curriculum teaching team under the Background of project-based Teaching Reform” (Project number: YB92) of the “14th Five-Year Plan” Higher Education Scientific Research Plan of Jiangsu Higher Education Association in 2021. This paper is about the sub-project direction 4 of the second batch of national Vocational Education Teachers' Teaching Innovation team research project of the Ministry of Education in 2021, “Research on the modular teaching mode and Method of teamwork of Electrical automation Technology professionals” (project number: ZI2021030104, project leader: Hongtao Ma). This paper is funded by the high-end research project of academic leaders in Jiangsu higher vocational colleges.

References

- [1] Haiyan Xie, Jingjing Xu, Jun Xie. Research and practice of modular teaching Strategy in Higher Vocational Education [J]. *Journal of Guangxi Radio and Television University*, 2022 (5): 5-9
- [2] Guangshun Wu, Ziyi Lin. Reform of “Three Education”: The endogenous driving force of high-quality development of vocational Education in the New Era [J]. *Jiangsu Education Research*, 2021(5): 70-73
- [3] Xiuying Xie, Yao Xue. Correlation analysis of Intelligent modular Teaching and learning curve of hysteroscopy specialist training [J]. *Medical Education Research and Practice*, 2022(6): 783-785