

Construction and Innovation of Industrial Robot 1 + X Practical Teaching Platform From The Perspective Of Industry University Cooperation

Zhelu Wang^{1, a}

¹Wenzhou Polytechnic, Wenzhou, 325035, China

^a382211678@qq.com

Abstract

Under the pilot background of industrial robot "1 + X" certificate system, this project explores the construction of industrial robot 1 + X practical teaching platform of "team leadership, platform bearing and school enterprise cooperation" from the perspective of industry university cooperation. Relying on Zhejiang industrial robot 1 + X management center, provincial R & D platform and intelligent manufacturing training, research and innovation integration practice platform, at the same time, it carries out industry education integration with enterprises, and establishes a "1 + X" industry university cooperation and school enterprise cooperation platform. Establish a practice platform of "dual integration, resource sharing, entity oriented, virtual reality parallel and intelligent education", so as to cultivate students' industrial robot application programming and engineering practice ability, and explore "1 + X" technical skilled talents of industrial robot suitable for school positioning and enterprise needs.

Keywords

1+X; Practical teaching platform; Industry university cooperation; Construction.

1. Introduction

In the past 10 years, many practical explorations have been made in the field of industry education integration and school enterprise cooperation. As a talent training mode of vocational education, industry education integration has been widely implemented in Colleges and universities, and the cooperative relationship between colleges and regional industry enterprises has been widely established. However, at present, the integration of industry and education and school enterprise cooperation are still at a shallow level, enterprises lack initiative and consciousness, the cooperation mode is relatively loose, and the cooperation level is not high. On August 27, 2019, the Ministry of Education issued the notice on confirming the participation in the second batch of vocational education and training evaluation organizations and vocational skill level certificates in the pilot of 1 + X certificate system, and determined Beijing sayuda science and Education Co., Ltd. and its industrial robot application program vocational skill level certificate as the pilot directory of the second batch of "1 + X" certificate system. After our college was approved as the first batch of national vocational education teachers' teaching innovation team in the field of double university construction and industrial robot, it was also approved as the second batch of "1 + X" certificate system pilot units for industrial robot application programming. Under the double high program and the "1 + X" certificate pilot of industrial robot application programming, finding a win-win point for both schools and enterprises is the key to stimulate enterprises to participate in the "1 + X" pilot, promote the integration of industry and education, and cooperate with schools and enterprises to educate people.

2. Construction of Practical Teaching System of This Project

2.1. Reconstruction of Industrial Robot 1 + X Practical Teaching System

The project takes the curriculum system of industrial robot technology as the carrier, reconstructs the "1 + X" practice system of industrial robot according to the "1 + X" standard system required by the industry, industry and enterprises, focuses on the industrial robot application programming entity training base jointly built by schools and enterprises, and constructs a virtual reality combination practice system of digitization + virtual simulation, At the same time, through the exploration of the new teaching mode of smart classroom + VR, we can realize the modernization and informatization of education.

2.2. Based on the Modular Practical Teaching System of Working Process, the Practice Curriculum Is Modular

Modular teaching is an important content of National Teachers' teaching innovation. Modularization includes two parts: one is modular curriculum, the other is modular teaching. In modular teaching, this topic takes industrial robot 1 + X practice course as the carrier. Firstly, the modular course content, taking the integrated application of industrial robot as an example, is divided into modular projects such as industrial robot welding, industrial robot handling, industrial robot palletizing, industrial robot assembly, industrial robot polishing and polishing. Then the teacher team is divided into groups to connect the automation, robotics and electromechanical courses of the double high professional group. The course is divided into sub tasks by project modularization. Teachers introduce the teaching method based on engineering process to complete the modular teaching of the corresponding project.

2.3. Construction of "1 + X" Digital Practical Teaching Platform for Industrial Robot Based on Cloud Classroom + Digital Twin Technology

With the cloud classroom of industrial robot "1 + X" course as the main line and the digital twin technology of industrial robot as the starting point, reconstruct the "1 + X" online teaching system of industrial robot, actively explore the integration and penetration of "1 + X" online course online and offline, and promote the reform and optimization of the teaching mode of combining virtual reality with 1 + X online and offline. According to the "1 + X" physical assessment platform of industrial robot, cooperate with Yalong, abb and other companies to build an industrial robot assessment platform through three-dimensional modeling, introduce ABB industrial robot robotstudio, Siemens MCD and other digital twin technologies, and introduce the digital twin platform to carry out virtual real combination simulation practice of simulating real physical prototype in online teaching.

2.4. Optimal Design of Teaching Evaluation for School Enterprise Collaborative Training

The combination of formative evaluation and outcome evaluation is adopted, and the achievements of 1 + X enterprise project practice are included in the curriculum teaching evaluation. Formative assessment focuses on the process assessment of students, schools and enterprises, including the performance of practice classroom and enterprise practice. It is comprehensively evaluated from the "three degrees" of participation, investment and contribution. The outcome evaluation includes online quiz and final test after the practice of 1 + X project.

The evaluation system focuses on the future development of students, pays more attention to the presentation and analysis of students' process data, and pays attention to the differences and emotional characteristics among students. The evaluation subject emphasizes diversification. All the objects participating in the activities are evaluators, including enterprise and school teachers, classmates or other people related to the activities.

3. Project Implementation Path

According to the "1 + X" skill standard of industrial robot and the demand of industry and enterprises for high skilled talents, this project constructs a new mode of industry university cooperation with "training evaluation organization college enterprise" as the main body. Combined with the respective advantages of industries, enterprises and schools, with the provincial management center as the lead, provincial and municipal schools' 1 + X pilot professional groups, connect with industrial enterprises for industry university cooperation and school enterprise cooperation, which has become a new path for industry education integration.

At the same time, it has carried out in-depth industry education cooperation with the world's top 500 enterprises in the field of electrical automation such as abb, leading enterprises in the domestic electrical industry and national electrical industry bases, and jointly built a national Intelligent Technology Collaborative Innovation Center, a national double teacher training base, a national productive training base, an "administrative school and enterprise" Intelligent Manufacturing Industry Education Alliance in the electrical industry, etc. In addition, we are further optimizing the school land and school enterprise cooperation mode, and are jointly building an electrical industry college with the local government in the national electrical industry base, so as to explore a new stage of industry education dual education of localized enrollment, training and employment in the industrial base.

Finally, according to the industrial robot 1 + X certificate pilot policy, self-assessment, the construction of industrial robot 1 + X teaching staff, and the establishment of industrial robot 1 + X provincial management center. In terms of industry university cooperation, establish cooperative mining construction, platform interoperability and resource sharing. Through school enterprise cooperation, reconstruct the industrial robot 1 + X practice platform, connect the three education reform, improve teachers, improve practice conditions, and explore new forms of loose leaf textbook compilation and project-based teaching reform. Through the assessment of students' 1 + X practical ability, evaluation and feedback, improve the talent training quality system assisted by X certificate, and then build the training system of students and social personnel under the qualification framework.

4. Conclusion

In order to more effectively promote the pilot work of "1 + X" certificate for industrial robots, the project, led by the National Teachers' teaching team, embeds curriculum modular + modular teaching into practical teaching. At the same time, with "training evaluation organization - Universities - enterprises" as the carrier, standardizes the dual cooperation between schools and enterprises, integrates production and education elements, and realizes the seamless connection between cultivating people and enterprise employment, At the same time, through school enterprise cooperation and dual education, improve students' teaching quality, and better connect million enrollment expansion and adult education.

Acknowledgments

This work was supported by the Special project of "Research on Higher Vocational Education" of China Association of Higher EducationNo.2020GZYB29, the teaching research project of Zhejiang Education DepartmentNo.jg20190734, the Special research project for higher vocational education of Wenzhou Vocational and technical collegeNo.WZYGJzd202002.

References

- [1] Wan Yufeng, Chai Wei. Pilot launch of "1 + X" certificate system in Vocational Education "one specialty and multiple abilities" to turn vocational school students into "generalists" [J]. China rural education, 2019 (13): 5-6.
- [2] Li Shoubing. Thoughts on the pilot work of 1 + X certificate system in Higher Vocational Colleges [J]. China Vocational and technical education, 2019 (10): 25-28.
- [3] Tang Yizhi. "1 + X certificate system": a system design on talent training and evaluation mode [n]. Guangming Daily, August 13, 2019.
- [4] Zheng Xuejiao, Jiao Jian. Problems and Countermeasures of 1 + X certificate system pilot -- pilot exploration of 1 + X certificate system for industrial robot technology specialty [J]. Modern vocational education, 2021 (41): 76-77.
- [5] Che Yuqiu. Curriculum reform and application of industrial robot operation and application based on "1 + X" certificate system [J]. Shanxi youth, 2021 (18): 113-114.
- [6] Wang Shuting. Research on the construction of "double qualified" teacher evaluation system under the 1 + X certificate system -- Based on analytic hierarchy process and fuzzy mathematics theory [J]. Journal of Heilongjiang Ecological Engineering Vocational College, 2021,34 (05): 90-93.