Research and Practice on the Construction of Laser Intelligent Equipment Teaching Base Built by School and Enterprise

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Abstract. Laser technology is a highly advanced field. It requires a certain level of theoretical knowledge and practical skills to be applied to practice. Therefore, the research on the construction of a laser intelligent equipment teaching base (LIETB) jointly built by schools and enterprises will be studied. First, the necessity of constructing a LIETB from three aspects is given such as the characteristics of the LIETB, the importance of constructing the LIETB, and the significance of the school-enterprise joint construction model for the teaching base. Secondly, a practical plan for the construction of a LIETB is proposed. Finally, the evaluation methods and indicators for the practical effects of the school-enterprise joint construction of the LIETB are improved from two aspects, such as teaching effectiveness and employment situation evaluation methods. This study is of great significance for improving students' practical environment and skill training, further enhancing the quality and quantity of laser intelligent equipment(LIE) application talents, promoting industry-university-research cooperation, and promoting the development of related industries.

1 Introduction

With the development of information technology and intelligence, the application of laser intelligent equipment (LIE) in manufacturing, medical, transportation, and other fields is becoming more and more widespread. The LIE is an important force to promote industrial upgrading and economic development. However, laser technology is a high-end subject. A certain amount of theoretical knowledge and practical operation skills is required to apply to practice. Therefore, the LIETB needs to be built. The research on the co-construction of LIETB between schools and enterprises has become the focus of attention of experts and scholars at home and abroad. From the analysis of the problems existing in the construction of industry-education integration training bases, the strategy of building training base by integrating production and education is explored by Chen [1]. After, the concrete implementation plan of the laser training base is studied. The research on innovation system and standardization of key industrial chain is given by Xie[2]. How to promote the construction of laser display industry chain innovation system is discussed. The construction plan of the soft science base is put forward. The research and Exploration on the construction of Practice teaching base are studied by Liu, Shi and Deng [3-5].

School-enterprise co-construction refers to the joint cooperation between schools and enterprises to carry out practical teaching and scientific and technological research and development activities, and achieve common development through resource sharing and complementary advantages. In the construction of LIETB, the model of school-enterprise co-construction can effectively promote the improvement of teaching quality and the enhancement of students' practical ability. In this regard, the research on the exploration of school-enterprise co-construction teaching bases has attracted wide attention from experts and scholars inside and outside. The 1-1-N practice teaching base construction model is given by Hu [6]. The "five-in-one" cooperation strategy of school-enterprise cooperation in building practical teaching base is explored by Zhang [7]. The difficulties and uncertain factors faced by the cooperative construction of practice teaching base between school and enterprise are studied by Li and Huang [8, 9]. Although there are uncertainties in the current school-enterprise co-construction, school-enterprise co-construction teaching bases are the main trend of current higher education development. The construction of LIETB has important significance and value for enhancing students' practical ability, promoting industry-academia-research cooperation, promoting industrial upgrading, and cultivating talent in LIE.

2 Necessity of building teaching bases for LIE

Building a LIETB is necessary. The base is needed for students and enterprises. The school-enterprise cooperation is promoted. And the industrial upgrading

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and the quality of education and teaching are improved. Therefore, the more excellent talents in LIE for society are cultivated. An advantage diagram for carrying out the construction of LIETB is given for Figure 1.

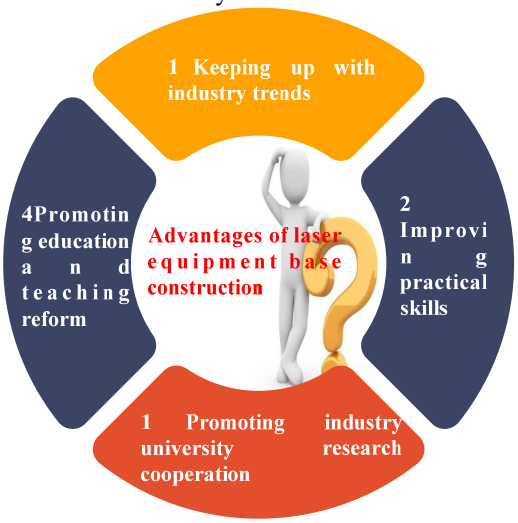

Fig.1 Advantages of LIETB construction.

Teaching Bases for LIE is a laboratory designed for students to learn and practice LIE technology. With the aim of cultivating students' practical skills, the operation and experimentation of LIE are emphasized to improve students' practical abilities and technical levels. And the theoretical knowledge and practical skills of laser technology is easily to understand by students. Then they work more easily. Teaching bases for LIE have some characteristics, such as a real production environment, advanced equipment, and focus on practical teaching, cooperation with enterprises, and talent cultivation, making it a student-centered, practice-oriented teaching model. The importance of building teaching bases for LIE is self-evident, such as meeting industry demands, improving students' practical abilities, promoting school-enterprise cooperation, enhancing education and teaching levels, promoting scientific and technological innovation, and cultivating more outstanding talents with innovative spirit and practical ability for society. Table 1 shows the importance of building teaching bases for LIE.

Co-construction between universities and enterprises is one of the important modes for the construction of LIETB. A lot of advantages are stimulated, such as promoting the improvement of teaching quality, achieving complementary advantages, promoting talent cultivation and strengthen cooperation between industry, academia and research. The construction of LIETB is closely related to co-construction between universities and enterprises. The meaning of school-enterprise co-construction is mutual cooperation between universities and enterprise. The practical teaching and scientific research activities are organized. The mutual development is got through resource sharing and complementary advantages. In the construction of LIETB, the mode of co-construction between universities and enterprises can effectively promote the improvement of teaching quality and the enhancement of students' practical abilities, and has the following relationships: (1) Improving teaching quality: Co-construction between universities and enterprises can provide richer resources and technical support to help universities better build LIETB and improve teaching quality. (2) Achieving complementary advantages: Universities and enterprises have different professional advantages and technical experience in the field of LIE. Through cooperation, resource sharing and complementary advantages can be achieved to achieve mutual development. (3) Promoting talent cultivation: Co-construction between universities and enterprises can promote the matching of enterprise talent needs and university talent cultivation needs, and improve students' practical abilities and employment competitiveness. (4) Strengthening cooperation between industry, academia and research: Through the mode of co-construction between universities and enterprises, universities and enterprises can carry out scientific research and innovation activities in the field of LIE, promote cooperation between industry, academia and research, and promote technological innovation and industrial development.

3 Practical scheme of building the teaching base of LIE

A lot of aspects are considered for the construction of the LIETB. The detailed implementation plan and management system are developed to ensure the smooth operation of the teaching base and the improvement of teaching effect. Figure 2 shows the schematic diagram of the practice plan for the construction of the LIETB.

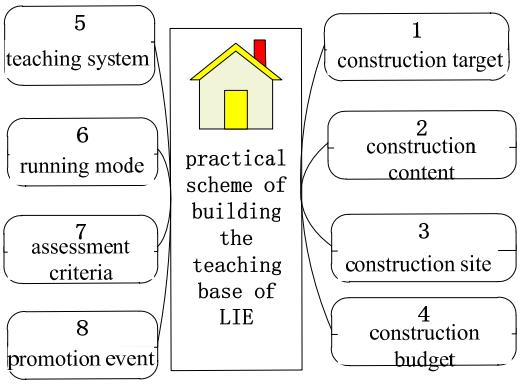

Fig.2 The schematic diagram of LIETB.

4 The practical effect of the teaching base of LIE jointly built by school and enterprise

The teaching base of LIE jointly built by school and enterprise is a kind of education model combining the resources of school and enterprise. It can improve students' practical ability and employment competitiveness. In order to evaluate the effect of this teaching mode, it is necessary to consider several aspects, such as teaching effect evaluation and employment investigation. Table 2 gives the evaluation methods and indicators of teaching effect. These survey results can help schools and enterprises constantly improve the construction of teaching base and teaching plan, improve students' employment competitiveness and satisfaction.

Table 1. The importance of building LIETB.

	Number	characteristics	Detail
The importance of building LIETB	1	Technical support for industrial development	LIE is an indispensable and important equipment in the field of manufacturing and science and technology. The construction of LIETB can provide relevant technical support and provide a strong guarantee for the rapid development of the industry.
	2	Students' practical ability	LIETB can provide students with real production environment and operating opportunities, help students better grasp the theoretical knowledge and practical skills of laser technology, improve practical ability and technical level, and better adapt to the job.
	3	Promote Cooperation between schools and enterprises	The construction of LIETB can promote school-enterprise cooperation, strengthen the alliance of industry, university and research, realize the sharing of knowledge, technology and resources, and promote industrial upgrading and technological innovation.
	4	Improve education and teaching standards	The construction of LIETB can promote school-enterprise cooperation, strengthen the alliance of industry, university and research, realize the sharing of knowledge, technology and resources, and promote industrial upgrading and technological innovation.
	5	Promote scientific and technological innovation	The construction of LIETB can promote scientific and technological innovation, promote the development and application of laser technology, and make contributions to scientific and technological progress and economic development.

Table 2. The evaluation method and index of teaching effect and employment situation.

	Number	Index	Method
or teaching effect of teaching and employment situation base jointly built by	1	student assessment results	The teaching effect is evaluated through the statistics and analysis of students' assessment results in practice of teaching base(PTB).
	2	students' practical ability	The teaching effect is evaluated by assessing the improvement of the skills and abilities learned and mastered by students in PTB.
	3	student	The teaching effect is evaluated by tracking and analyzing the employment

		employment situation	situation of students after graduation.
	4	student satisfaction survey	The teaching effect is evaluated through the investigation and analysis of students' satisfaction in the practice process of teaching base.
	5	employment rate	The degree of help of teaching base to students' employment is evaluated through the investigation and analysis of the employment rate of students after graduation.
	6	employment field distribution	The degree of help of teaching base to students' career development is evaluated by the investigation and analysis of the distribution of graduates' employment fields.
	7	employment pay level	The teaching base's improvement effect on students' employment salary level is evaluated by the investigation and analysis of graduates' employment salary level.
	9	employment satisfaction survey	The effect of teaching base on students' employment satisfaction is evaluated by the investigation and analysis of graduates' employment satisfaction.

5. Conclusion

The construction of the LIETB is very fruitful. Not only that, the practical ability of students are improved, the deep integration of production is promoted. The quality and influence of education and teaching of the school is also improved. Then the overall development of the university is promoted. (1) The students' practical ability is improved. A better practice platform and resource support is provided by the LIETB provides. The relevant technology and practical ability are got. The competitiveness of employment is improved. (2) The ability of scientific and technological innovation is enhanced. The deep integration of school, enterprise, university and research is promoted by the construction of the LIETB. And the cooperation between industry, university and research is promoted. The scientific and technological research and development and technological innovation through the base are carried out. The ability and level of scientific and technological innovation are improved. (3) The industrial development is promoted. The development of local LIE industry is promoted. The contributions of local economic development are made positively. (4) The quality of education and teaching are improved. The better teaching conditions and resource support are provided by the construction of the base. A more comprehensive, in-depth and professional teaching is carried out. The comprehensive quality of students is improved.

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