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Exploration of Talent Training Models for Electrical Engineering Majors in Local Agricultural Universities under the Background of New Engineering

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Abstract: With the continuous development of China's electrical industry, there is an urgent need for universities to provide more high-quality talents for the industry. Under the background of new engineering disciplines, undergraduate education in electrical engineering in local agricultural universities should be combined with industry needs, and the talent training mode should be changed. In the context of the new engineering discipline, this paper analyzes the trend and status of talent training reform in the field of electrical engineering. It proposes to explore the talent training model in the field of teaching staff, mentor system, science and technology associations, internship and practical training, innovation ability, scientific research team, and school enterprise cooperation, in order to cultivate interdisciplinary and applied innovative talents in the field of electrical engineering.

Keywords: New Engineering; Electrical engineering; Talent cultivation; Mode

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Introduction

Since 2017, the Ministry of Education has been vigorously promoting the construction of new engineering disciplines, launching a series of new engineering research and practice projects, driving more higher education institutions to participate in the construction of "new engineering disciplines", and making contributions to the development of a strong higher education country in China. Compared to traditional engineering, new engineering is closely related to the development trend of emerging industries, and it is an upgrade to traditional engineering majors. Therefore, local agricultural universities urgently need to be supported by new engineering disciplines to better serve regional economic development [1-2].

Electrical engineering is a traditional engineering major that includes multiple specialties such as power systems, smart grids, computer technology, electronic information, etc. Its knowledge system covers a wide range, theory is linked to practice, and it cultivates high-level engineering and technical talents with broad application prospects. With the development of digital economy and information technology, the electrical industry has rapidly developed and applied in various fields [3]. However, outdated teaching methods and training programs have limited the formation of electrical engineering professionals, resulting in some gaps between current electrical engineering students and the actual needs of today's society. This gap is mainly due to modifications made to the talent training plan, ignoring the updated requirements of the new industrial era. Therefore, developing a reasonable talent training plan is an urgent problem that needs to be solved in the field of electrical engineering.

1. The Reform Trend of Talent Training Model in Electrical Engineering under the Background of New Engineering

With the advent of the technological revolution, the pace of economic globalization is driving the exchange and integration of knowledge. Industrial reform is closely related to higher education, and innovation in various fields cannot be separated from the support and guarantee of talents, especially comprehensive talents who meet the requirements of new engineering disciplines. The industrial reform has also proposed the next stage of talent cultivation goals, and the development of new engineering education will inevitably greatly promote the improvement of the country's independent research and development capabilities. The goal of the new engineering program is to cultivate engineering talents and improve students' scientific and technological innovation abilities. Due to various factors, the practical and innovative abilities of most undergraduate students need to be improved. Therefore, it is necessary to focus on updating and improving educational methods, improving talent cultivation models, and strengthening students' practical application abilities. By optimizing existing teaching resources and promoting the cultivation of students' innovative comprehensive qualities and practical abilities, we can ensure the transformation of the new industrial era. In order to adapt to the rapidly changing technological situation, local agricultural universities have made "new engineering" the most important development goal at present, and have put forward higher requirements for high-quality and comprehensive talents in response to the new round of strategic needs in China. Therefore, reforming the talent training mode for the power engineering profession is of great significance in both theory and practice.

2. Current Status of Talent Training in Electrical Engineering

2.1 Teacher allocation

Teachers are the main body of the construction of the teaching staff in universities, and a high-quality and highly educated teaching staff is the key to enhancing professional connotation. However, through a survey of local agricultural undergraduate colleges, it was found that the structure of the teaching staff is relatively single, with young teachers with master's degrees being the majority, and a relatively small number of middle-aged teachers with intermediate and senior professional titles. Some majors still have professional title gaps. At the same time, most frontline teachers do not have internship experience in enterprises and cannot understand the needs of society and enterprises well. This results in the classroom mainly based on knowledge from books, and cannot impart engineering application cases to students. However, the new engineering discipline requires teachers to have both good professional knowledge and educational technology, as well as strong innovative practical abilities. In order to improve the scientific research level and innovation ability of college students, teachers are encouraged to guide students to participate in various science and technology innovation activities and conduct subject competitions.

2.2 Experimental and Training Conditions

The practical process is an extension and supplement to the teaching content of theoretical courses, a way to consolidate knowledge, and also a carrier to promote creativity. Therefore, the effectiveness of the practical process is directly related to the cultivation of students' engineering application abilities, and is also the key to the teaching reform of new engineering majors. The experimental training programs of local agricultural colleges are mainly divided into two parts, namely classroom experiments and separate experimental courses. The experimental content is mostly theoretical and confirmatory experiments. This leads to a lack of design and comprehensiveness in the experimental process, which is particularly important for cultivating applied talents. In addition, in practical teaching, due to outdated equipment and relatively lagging equipment updates, the teaching effect is not ideal.

2.3 Cooperation between schools and enterprises

Cooperation between universities and enterprises is essential. On the one hand, universities should cultivate students to apply the knowledge learned from books to practical work, so as to achieve practical application of what is learned. At the same time, enterprises also need to constantly break through and innovate in technology, which requires universities and enterprises to maintain close cooperative relationships. From the development of Heilongjiang Bayi Agricultural Reclamation University in recent years, it can be seen that our university has indeed made some attempts in talent training programs, experimental and practical training conditions, curriculum optimization, and other aspects. However, the effectiveness of school enterprise cooperation still needs to be further improved.

3. Suggestions for Improving the Training of Electrical Engineering Talents in Three Local Agricultural Universities

3.1 Optimizing the teaching staff

Universities should strengthen the construction of the teaching staff and enhance the connotation of the teaching staff. Due to the fact that electrical engineering is a national key development major, various universities will introduce talents of different levels in batches every year. In order to adapt to the development of new engineering disciplines, full-time teachers should be sent to

enterprises for on-the-job training to enhance their professional and technical abilities. Through in-depth cooperation with enterprises, the employment guidance role of enterprises can be fully utilized, and at the same time, research resources from universities can be utilized to accelerate the integration of industry, academia, and research, achieving the transformation of achievements. Establish a research team, with the new engineering discipline as the main line, actively carry out research on teaching reform and curriculum reform in the field of electric power. At the same time, the school actively carries out teacher training work and collaborates with multiple enterprises to cultivate talents in the fields of Internet of Things, robotics, and big data.

3.2 Improving internship and training conditions

To improve the comprehensive quality of students, universities should continuously improve their laboratory environment and practical conditions. As a profession with high requirements for experimental and practical training conditions, electrical engineering majors have renovated and upgraded existing professional laboratories, eliminated some equipment with outdated functions, and purchased current mainstream experimental equipment and instruments. And renovate the experimental training venue to increase the cultural construction of the venue. Secondly, expand the traditional professional experimental training room. Under the guidance of project driven teaching method, design and comprehensive experiments are conducted continuously, which is an effective teaching method. On the existing experimental platform, we will continue to strengthen intelligent experiments and integrate the ideas of new engineering disciplines into experimental teaching.

3.3 Make full use of school enterprise cooperation resources to strengthen practical abilities

In the context of the construction of new engineering disciplines, according to the latest version of the national talent training plan, electrical majors in local agricultural colleges should focus on the digital job capabilities of industrial enterprises, continuously integrate industry and education, break through the barriers of traditional professional fields, and cultivate professional talents that meet the needs of new engineering disciplines. Through analyzing the problems and shortcomings that arise during the process of school enterprise cooperation, it is proposed that universities should actively engage in short-term and long-term cooperation with enterprises in the electrical industry, and explore how to cultivate talents. Through summarizing the preliminary work of the school and conducting in-depth visits and investigations, we will continue to expand the scope of cooperation between the school and electrical enterprises, and have launched extensive cooperation. In addition, experts in the electrical industry can be invited to give lectures or give on-site lectures to senior undergraduate students either online or offline. Establish joint laboratories between universities and enterprises, fully utilize existing experimental platforms, and expand experimental content. Through regular lectures, teachers with extensive experience in subject competitions and familiarity with the use of experimental equipment can provide students with a comprehensive understanding of the existing teaching platforms in the school, thereby stimulating learning interest and improving hands-on practical skills.

4. Conclusion

Under the background of new engineering, the development trend and talent demand of the electrical industry have undergone significant changes, and there is an urgent need for local agricultural universities to better serve the regional economy. This article proposes improvement suggestions for the talent cultivation mode of electrical engineering in local agricultural universities, based on the trend of talent cultivation mode reform in the context of new engineering disciplines and the current status of talent cultivation. Exploring the teaching staff, mentor system, science and technology association, internship and practical training, innovation ability, scientific research team, and school enterprise cooperation, in order to provide reference for the cultivation of electrical engineering professionals in local agricultural universities.

References:

[1] Fan Jiale, He Ping, Li Congshan. Current situation and reflection on talent cultivation in the field of electrical engineering in local engineering colleges under the background of new engineering disciplines: Taking Zhengzhou University of Light Industry as an example [J]. China Modern Education Equipment, 2023 (21): 89-91+95

[2] Luan Guangyu, Li Aichuan, Wang Dongxin, et al. Reflections on the Training of Electrical Engineering Talents in Local Colleges and Universities under the Background of New Engineering [J]. Heilongjiang Education (Theory and Practice), 2018 (04): 4-5

[3] Lin Jianxin, Lan Lijin. Exploration of talent cultivation models for electrical majors in the context of new engineering disciplines [J]. Journal of Electrical and Electronics Education, 2024,46 (01): 38-40

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