Research on the Improvement of Practical Ability of Electrical Information Talents Based on Maker Space

Qiqi Wei[*] and Weixiao Chen

Guangxi University of Science and Technology, Liuzhou, Guangxi Zhuang Autonomous Region, China
Corresponding author. Email:85638562@qq.com

ABSTRACT

With the continuous adjustment and matching of the demand for talents in the social market, it puts forward severe challenges and major opportunities for talent quality engineering in the process of university development under the new situation. As local engineering colleges, how to better transform, how to adapt to the development of the trend of the times, how to cultivate higher-level talents more in line with the needs in the new round of "innovative education" will be a major issue for many educators to study and think deeply. This paper explores the establishment of innovation association, the establishment of the professional service teams, and the construction of school-enterprise cooperation bases.

Keywords: Maker space, Talent training, Practical ability.

1. FEATURES OF MAKER SPACE IN COLLEGES AND UNIVERSITIES

Since the Internet technology, based on open-source hardware, rapid prototyping and 3D manufacturing tools, the maker space in colleges and universities has transformed the fantastic ideas of the maker into real products to serve the maker community and meet the personalized needs. It provides a space with an open-source hardware platform, open laboratories, processing centres and product design guidance for the maker and realizes the collision and exchange of ecological chain management and creative ideas. This is a maker space for all students that are not profit-oriented, and it is closer to the origin of maker culture-- the community type of interest and hobbies.

First, low-cost service: Some schools have overcome many disadvantages due to financial resources and geographical location, and renovated the overhead layer, the negative first floor and the underground part of some idle teaching buildings for a long time. According to the functional plate of the maker space, they are divided into office areas, communication areas, service areas, exhibition areas, road performance areas, production area and so on, which basically meet the requirements of the makers. These places have managed the students by themselves, giving full play to their sense of ownership. At the same time, under the premise of normal experiment teaching

and scientific research task, universities actively create conditions to increase the opening of laboratories, processing centre, including a robot, the Arduino, 3D printing, manual production, laser cutting and so on, to promote the opening and sharing of teaching and scientific research experiment platforms, make full use of laboratory resources, and improve the effective utilization rate of the experimental equipment.

Second, conditions for facilitation: Maker space is not only a place for makers to make and develop products but also needs to communicate with each other and create more creative ideas using their interconnected thinking. In the form of a project, students of different grades and majors will gather together to complete a project by complementing each other, which is the core part of maker space. Part of the schools' maker space is just under the dormitory building. Students do not have to go far in their spare time, and even sometimes, they are busy too late at night without security problems. With the development of maker space, the function has been basically mature and complete.

Third, the integration of all factors: By the provision of venues, equipment, spare parts and materials, and infrastructure, etc., maker space on campus is convenient for makers to make inventions, Exchange discussions, product presentations, and project roadshows. At the same time, there are necessary training lectures, theme salons, experience sharing,

professional forums, etc., so as to update knowledge and impart technology in a more timely and extensive manner. We can also provide the corresponding product grinding and business incubation for some excellent and promising maker projects.

Fourth, an open platform: The original intention of maker space is to carry out maker activities for the purpose of interests and hobbies. It breaks the restrictions of major, grade and distance, allows makers with common interests to get together, enables the integration of campus resources and social capital, and achieves crowd creating, crowd supporting and crowdfunding. This openness is a kind of benign interaction. Supported by both inside and outside the school, teachers and students, different models are constantly derived, interest and hobbies transformed into innovative ideas, creativity is pushed into practice, and production factors are deeply connected with makers (students) to achieve technological innovation and breakthrough.

2. ANALYSIS OF THE PROBLEM OF INSUFFICIENT PRACTICAL ABILITY OF COLLEGE STUDENTS

2.1. Insufficient Attention is Paid to the Cultivation of Practical Ability

At present, colleges and universities are in the compression of the class hours, that is, the compression of theoretical courses. However, some teachers think that the course is the core and backbone course of the major. They worry that the content of the course will not be finished and the key points will not be highlighted, so they spend most of their time on theory teaching, which reduces the time of practical teaching. In teaching mode, teachers are given priority to teaching, so that students are inculcated to accept theoretical knowledge, practice and similar simulation, the scene teaching, scene teaching, while interactive teaching methods such as practical simulation, field teaching and situational teaching are relatively lacking. This can strengthen the learning of students about the basic knowledge, but the cultivation of students' innovative thinking and ability is sufficient, their practical ability is poor, and the cultivation of practical ability is not valued.

2.2. Paying More Attention to Scores, Theory with Practice is not Enough

Most students still regard the campus as an "ivory tower" and have a relatively simple concept of learning knowledge. They, including their parents, do not want students to contact society too early and feel there are some hidden dangers and dedication. But from the perspective of learning new knowledge and accepting new things, it is, of course, necessary to be in line with

society. Especially in today's rapidly changing knowledge, economy and technology, "self-contained" and "closed-door driving" will sooner or later be eliminated by society. Insufficient integration with the market is prone to appear academic disconnection. Some of the case knowledge taught by teachers and in books can no longer adapt to the requirements of the current era, lack of practical testing, and have little significance for students' future learning and work guidance.

2.3. Emphasis on Research, but the ACHIEVEMENTs of the Project are Weak

Traditional teaching mainly focuses on students' mastery of knowledge and does not pay enough attention to the cultivation of practical ability. Even if numerous homework is arranged in the classroom, students are very active to submit, but the exam results are not ideal, and employers do not have a high evaluation of students' practical ability. Most of the enterprises corresponding to students majoring in electrical engineering carry out production and operation in the form of project. Therefore, students are highly required in project management and operation, as well as autonomy and initiative. However, due to the lack of project organization and management in school, students cannot find the technical means and paths to solve problems through teachers' tips and complete a project independently, so their comprehensive ability cannot be improved.

3. PRACTICE EXPLORATION OF TRAINING ELECTRIC TALENT BASED ON MAKER SPACE

Guangxi University of Science and Technology is a local engineering college. Since its establishment for many years, the school leaders, the Academic Affairs Office and the Youth League Committee have always attached importance to the development of students' extracurricular scientific and technological innovation activities, supported and encouraged students' hands-on and innovation, and issued a series of policies, such as the school office of every subject for electrical information engineering project class competition, students' scientific research project and the recent development of the school year and assignment of the project application, etc. At present, Guangxi University of Science and Technology has the "Electrical Information College Student Innovation Laboratory", "Computer Software Laboratory", "Mathematical Modeling Laboratory", "Innovation and Entrepreneurship Studio of Automobile College" and "Intelligent Innovation Laboratory" participated in by a large number of electrical information majors. "Control Laboratory", and "College Student Electronic Design Enthusiast Studio" of Lushan College, Guangxi

University of Science and Technology. There are nearly 400 square meters of specialized experimental sites and certain experimental equipment. For many years, the relevant laboratories have been operating well, the relevant rules and regulations are reasonable and complete, and the school has received strong support in the equipment and venues. This project has a good foundation for teaching reform and a good software and hardware environment [3].

3.1. Establishment of Innovation Association

The Electrical Information Innovation Association of the School of Electrical Engineering is a platform for innovation enthusiasts to improve their professional skills, show themselves, and realize value. This platform is conducive to increasing the competitiveness of school students in the national electronic design competition, robotics and other discipline competitions, and improving the school The popularity of electrical, electronic, and automation majors in universities in Guangxi and even the whole country promote the prosperity and development of scientific research and subject competitions in our school, and cultivates undergraduates in autonomous learning, cooperative learning, task-driven learning, and research learning, and effectively improves undergraduates The quality of student training, and in terms of electronic design and robotics competition, has reached the leading or close to the advanced domestic level of universities in the southwest region, and cultivated more and better high-level innovative talents for the country, especially the western region and Liuzhou. In 2018, members of the association were approved for six national-level innovation and entrepreneurship projects for college students, 16 at the autonomous region level, one, third prize in the National Underwater Robot Competition, one, first prize, three, second prizes, and third prize in the Guangxi University Student Electronic Design Competition. Three awards; 6 national-level innovation and entrepreneurship projects for college students were approved in 2019, 19 at the autonomous region level, one, second prize and two, third prizes in the third Guangxi University Drone Competition. The cumulative number of awards in the past five years accounted for 77.8% of the proportion of students awarded in the college.

3.2. Set up a Professional Service Team

The electrical maintenance service team has been established for more than 20 years. In the beginning, it was led by professional teachers to teach technology and personally went to communities and towns to carry out free maintenance (only the necessary parts and components update fees are charged), and it serves nearly a thousand people every year. This voluntary service activity has been supported by more students. In addition, students from the School of Electrical Engineering, students from the School of Mechanical Engineering and Automobile have also joined the team. The original teacher led the team, and the students became old and new and passed on from generation to generation. The professional service team is the best way for students to integrate professional knowledge into social practice. They can not only apply what they have learned but also contribute to society, and improve students' enthusiasm for professional learning and a sense of mission of social responsibility.

3.3. School-enterprise Cooperation to Establish a Maker Workshop

Since its foundation in 2015, Guangdong Embedded crowd-creation space is a global IT technology product research and development and education service organization. It is oriented by Internet +, Internet of Things, intelligent manufacturing, VR technology, big data, cloud computing, artificial intelligence, etc. For the purpose of promoting and realizing new development in the field of science and technology, it has been awarded A-level evaluation for three consecutive years, and it is an excellent creative space in Guangdong Province. In the fields of hardware support, political and business services, technical support, education services, and financing services, it provides all-element innovation and entrepreneurship services for the majority of creators. The School of Electrical Engineering cooperated with Guangzhou Yuejian Communication Technology Co., Ltd. to share the achievements of the four major brands that Yuejian already has IT technology training, teaching equipment, digital medical system, and animation and game console products. Yuehan recruits students for training in schools, and the school provides venues. Yuehan invests in the establishment of maker workshops (innovation laboratories) and carries out corresponding project cooperation and technical guidance.

3.4. Build a Professional Practice Platform

The college, together with Guangxi Science and Technology Museum, Liuzhou Science and Technology Museum and Liuzhou Maker City, will jointly carry out a series of maker activities to develop local maker resources and send more students to the forefront of science and technology activities, competitions, services and innovation exhibitions. It broadens students' horizons, enhances their skills, and strengthens technical exchanges between other universities and units. The college has project cooperation with Liuzhou Feishengpeng Technology Co., Ltd. (alumni enterprise). The company is a collection of automotive electronic products research and development, manufacturing and sales, scientific research project cooperation and scientific and technological information consulting

services and a body of science and technology enterprises. At the same time, the college also has a long-term cooperative relationship with Liuzhou Wute Trading Co., Ltd., Shenzhen Shenglan Technology Co., Ltd., Liuzhou Boshiwei Automobile Technology Co., Ltd., and Liuzhou Liwan Technology Co., Ltd., in the process of cooperation, the students' project making ability has been improved[4].

3.5. Deepen the School-running Characteristics of "School-enterprise cooperation, School-city Integration"

The school-running feature of Guangxi University of Science and Technology is to jointly establish a "Board of Directors" with Liuzhou City Government and large enterprises, use the resources of the "Board of Directors" to support the school in running schools locally, and set up a number of practical bases for college students. Deepening the collaboration and innovation of school-government-enterprise cooperation has profound significance for cultivating students' practical ability. Relying on the school's crowd-creation space for curriculum design, internships, and practice, strengthening the joint guidance of enterprises, outside experts, and school teachers, through the opening of project teaching and case teaching, the subjective initiative of students is better exerted and students' The expansion of innovative thinking in practical projects.

4. CONCLUSION

Maker space should adjust the relationship between University makers and the external environment by creating a resource rich and reasonable environment. Its internal environment, office space, consultation and guidance are very important for University makers. The orientation of local engineering colleges for electrical information talents is application-oriented. In the process of talent training, they pay special attention to the cultivation of practical ability. However, some colleges and universities do not pay enough attention to the cultivation of College Students' practical ability, do not integrate theory with practice, and the project achievement is weak. After exploration and research, combined with practice, The countermeasures are as follows: first, establish the Innovation Association of electrical college students to carry out daily research in the form of project; Second, set up a professional knowledge practice service team to test the results of professional learning in the way of community practice;

Third, establish a school enterprise cooperative maker workshop to integrate with the society in advance by means of resource introduction; Fourth, establish a professional practice platform to improve the project production ability; Fifth, establish a team with school government and enterprises as mentors to increase practical ability with case teaching.

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