

Analysis on Four-dimensional Innovation and Entrepreneurship Education Model in Higher Vocational Colleges

Taking Zhejiang Industry Polytechnic College as an Example

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Abstract—Although the development of innovation and entrepreneurship education in vocational colleges lags behind undergraduate colleges, some higher vocational colleges have also formed a series of innovation and entrepreneurship education models, and achieved fruitful results in theory and practice in recent years on the road of learning and self-exploration. It analyzes its concrete measures in the four dimensions of consciousness, teaching, practice, and achievement taking Zhejiang Industry Polytechnic College as an example. It also introduces the experience in atmosphere creation, teaching reform, simulation practice, and achievement transformation.

Keywords—higher vocational colleges; innovation and entrepreneurship education; four-dimensional

I. INTRODUCTION

Innovation and entrepreneurship education is an important task that all colleges and universities must pay attention to under the new situation. It concerns the development of students, the development of schools, and the future of the state, which is an inevitable trend in the era of knowledge economy. Higher vocational colleges and undergraduate colleges have different in the aspects of school levels, training location, average education years, etc. Therefore, the innovation and entrepreneurship education must be developed in combination with their own characteristics when learning from others. The model should also follow the rules of vocational education and form a joint force in the four dimensions of consciousness, teaching, practice, and achievement. There should also be four levels within each dimension to integrate resources and exert synergies to effectively nurture and upgrade the innovation and entrepreneurship ability of higher vocational college students.

II. PAYING ATTENTION TO TOP-LEVEL DESIGN OF SCHOOLS AND CREATING A STRONG ATMOSPHERE OF INNOVATION AND ENTREPRENEURSHIP

The implementation of innovation and entrepreneurship education in higher vocational colleges is in need of the

mutual coordination of four dimensions including appreciation of the school leaders, support of the relevant departments, recognition of all staff, and the wide participation of all students, which requires higher vocational colleges reflecting innovation and entrepreneurship education in the top-level design. Only in this way can we mobilize more resources to implement it, and all policies and propaganda orientations can be implemented.

The innovation and entrepreneurship education under the top-level design will inevitably play a role in comprehensively enhancing the awareness of innovation and entrepreneurship. The awareness of faculty and staff in the whole school has been improved. As long as it is reflected in the mechanism and system with the addition of campus cultural activities working as carriers, the awareness of innovation and entrepreneurship of students will be enhanced naturally, and the atmosphere of innovation and entrepreneurship will be strengthened. Under the leadership of the college leaders, teachers of Zhejiang Industry Polytechnic College not only traveled several times to inspect innovation and entrepreneurship education in higher vocational colleges, but also actively learned from undergraduate colleges, and invited the principals and backbone teachers of Entrepreneurship Academy in elite colleges and institutes to share experience in schools. More importantly, the college also incorporated innovation and entrepreneurship education into the "13th Five-year Plan" development plan of the Zhejiang Industry Polytechnic College and make it serve as an important measure for the college to deepen the reform of talents cultivation model. Relevant departments and units also actively bring their superiority into full play. The state that the office of academic affairs was responsible for organizing the contest, human resources office was responsible for the teachers construction, the Ministry of Humanities and Social Sciences was responsible for curriculum provision, the Employment Department was responsible for service consulting, Youth League Committee was responsible for mobilization and publicity and the faculty and staff of the branches actively cooperate with each other was preliminary established.

In addition, the relevant departments and agencies carried out various innovative and entrepreneurial activities on the campus, such as innovation and entrepreneurial competitions, entrepreneurial simulation training, entrepreneurial club activity month, sharing session of entrepreneurship youth, exhibition of innovative product, etc., to create a good atmosphere of innovation and entrepreneurial and penetrate innovation and entrepreneurship education into all aspects of higher vocational education.

III. STRENGTHENING THE CONSTRUCTION OF TEACHING STAFF TO CREATE THE TEACHING INTEGRATED WITH PROFESSIONAL SKILLS

The innovation and entrepreneurship education in higher vocational education is inseparable from a high-quality innovation and entrepreneurial teaching staff. Due to the importance and particularity of innovation and entrepreneurship education, college innovation and entrepreneurship education also determines the diversity of teaching staff, which means that entrepreneurial tutors not only need the background of professional theories, but also requires the teachers with rich practical experience in entrepreneurship. However, there are not many teachers who are qualified as “double-qualified of theories and practice” in the field of innovation and entrepreneurship education. It not only requires schools bringing in the “double-qualified” teachers from the outside, but training inside.

“Entrepreneurship education should have a complete teaching system. First, entrepreneurship education cannot be carried out in isolation from knowledge education and professional education, because the cultivation of human creativity and innovation ability cannot be learned simply by repeating and practicing repeatedly. It is generated subliminally in the accumulation of time and constant self-adjustment and improvement with the influence of scientific and humanistic knowledge through the inhalation and understanding of the personal growth process on the basis of professional knowledge.”¹ On the aspect of teaching levels of the innovation and entrepreneurship education in higher vocational education, the relationship among the four dimensions of the school tutors, enterprise mentors, general education curriculum and professional curriculum should be straightened out.

Moreover, for higher vocational colleges, innovation and entrepreneurship education cannot be taught as a single course, it should be integrated with professional teaching, and integrate innovation and entrepreneurial content into professional skills teaching, which is the essence of vocational education in itself. As we all know, skilled talents must have a sense of innovation and craftsmanship spirit. Only in this way can we produce results on the job and make technological breakthroughs. It is difficult to achieve the

fundamental purpose of innovation and entrepreneurship education simply by relying on a course or some elite selection and training.

Zhejiang Industry Polytechnic College has realized the problem that innovation and entrepreneurship teachers were inadequate. Since 2015, it has sponsored about 100 teaching and administrative staff to participate in national, provincial and municipal teacher training, such as KAB entrepreneurial instructors, SYB entrepreneurial tutors, The Entrepreneurship Mentoring Project of Zhejiang Province, etc., and encouraged teachers and staff to participate in pioneering instructions for students entrepreneurship guidance and after-class training. One of the teachers was selected as the Repository of Innovation Entrepreneurship Tutors in the state and was rated as Young Talents of “Two Creativity” in Yuecheng, Shaoxing, and a number of teachers were rated as the outstanding instructor of Innovation and Entrepreneurship Contest in Zhejiang Province and the outstanding instructor of Entrepreneurship Contest in Shaoxing. In addition, the school also actively introduced enterprise tutors together with professional teachers to add practical features from competition guides, entrepreneurship forums to project development, etc. by taking advantage of industrial design base in Shaoxing. In terms of teaching, each teaching unit actively integrates innovation and entrepreneurship education into the theoretical and practical training courses, inspiring students' creativity from educational perspective, and encouraging students to carry forward the entrepreneurial spirit of hard struggle.

IV. LEVERAGING THE MUTUAL COOPERATION OF SCHOOL AND ENTERPRISES TO BOOST SIMULATED PRACTICES OF STUDENTS INNOVATION AND ENTREPRENEURSHIP

Innovation and entrepreneurship education is essentially a practical education. The training objectives of higher vocational colleges are also cultivating innovative applied talents. In the final analysis, they are talented people who have skills, innovation, and are useful to the development of local characteristics industries. It also determines that higher vocational colleges attach special importance to the school-enterprise joint training of talent, and in order to serve the local areas and industry, college scientific research should also focus on school-enterprise interaction, take measures in line with different needs and adjust professional setting continuously in accordance with market changes. Of course, the above is also inseparable from the investment of enterprises, industries, and localities, especially the support of the construction of training bases and industrial parks. The co-construction of the training base and the industrial park will play a role of resource sharing and agglomeration, allowing the innovation and entrepreneurship education to shine in the culture of school-enterprise cooperation as well as cooperation of school and local regions.

Therefore, higher vocational colleges must rely on cooperation between schools, enterprises, and local education governments to achieve mutual benefit and win-win results, and promote the development of student innovation and entrepreneurship simulation practice in the

¹ Chen Hong, Qi Zhongliang, Chen Ying. The Construction and Suggestions of Undergraduate Entrepreneurship Supporting Platform in Higher Vocational Colleges — Based on the Survey of 12 Vocational Colleges in Jiangxi Province[J]. Vocational & Technical Education Forum, 2014.17.

four dimensions of personnel training, scientific research, professional skill upgrading, and base construction.

Zhejiang Industry Polytechnic College leverages on cooperation between schools and local education governments to build a practical training base in Shaoxing. It helped the development of professional and innovative entrepreneurship education in the areas of exhibition hall construction, equipment procurement, teacher training, scientific research, and skills competition, etc., and cultivated many groups of craftsmen who possess both superb technology and Innovation and entrepreneurship. In addition, it established Shaoxing Industrial Design Base with Commission of Economy and Information Technology in Shaoxing, Shaoxing Industrial Design Association and initiated the mode of Base and College according to the development of special industries in Shaoxing, which truly achieved the two-way interaction of teachers, rapid transformation of scientific research results, and great improvement of student training. It is also a major feature of Zhejiang Industry Polytechnic College in carrying out entrepreneurship education in schools, enterprises and local regions. Taking advantage of geographic advantages that Shaoxing industrial design base is located on the campus; the college not only opens a green channel for production, education, and research, but also opens up a fast-moving social and industrial highway for students. Students will be able to come into contact with famous and international companies, which not only helps broaden their horizon, but also understand the hardships and difficulties of starting a business deeply.

V. ESTABLISHING A PLATFORM FOR ENTREPRENEURIAL PRACTICE TO ENSURE THE TRANSFORMATION OF INNOVATION AND ENTREPRENEURSHIP EDUCATION ACHIEVEMENTS

Entrepreneurship education not only includes the inspiration on the level of consciousness, but also advocates the development of entrepreneurial practice. Only the two combined together can the ultimate purpose of entrepreneurship education be truly achieved. However, the development of entrepreneurship practice is inseparable from the construction of entrepreneurship practice platform. At present, Zhejiang Industry Polytechnic College builds the entrepreneurial practice platform of college from the four dimensions of the maker space at the department level, the entrepreneurial practice base at the school level, the creative space at the school-enterprise cooperation level, or the industrial zones at the off-campus government or enterprise level.

A. *Maker space at the Department Level*

The level is the first level of the entrepreneurial practice platform of colleges. It has the characteristics of being small and beautiful, with low barrier to entry, and is generally used for the introduction of projects integrated with specialized characteristics. Currently, the college has platforms at the department level such as the four dimensional maker spaces of School of Design and Art as well as the E-commerce Incubation Platform of School of Economics and

Management. Taking the four dimensional maker space of Design and Art department as an example:

The four dimensional maker space of Design and Art department (Maker Class) was established in September 2015. It is located at the S110 Industrial Design Base in Shaoxing and covers an area of about 60 square meters. There are three areas in the space, namely convention area, foundation work area and negotiation area, and the foundation work area is the primary area among them. There are all kinds of tools and office equipment needed by the creators in the area, and the stationed project enjoys three exemption policies of sites, properties, and services.

The "four dimensions" has three levels of meaning. On the first lay, from the perspective of the professions of the School of Design and Art, "four dimensions" symbolizes four dynamic and strong majors of School of Design and Art including the computer application, three-dimensional animation design, graphic image production, and industrial design; on the second lay, from the perspective of platform function, "the four dimensions" refer to the four incubation sequence of maker space of departments - college entrepreneurial practice base - Industrial Design Base in Shaoxing to Provincial innovation park outside school, and the function of the four-dimensional maker platform is to boost the development of projects to a higher entrepreneurial platform; On the third lay, from the nature of innovation, "the four dimension" refers to creativity, innovation, invention, and entrepreneurship. Up to now, there has been more than 30 creative projects, 17 incubation projects, 48 makers, 11 entrepreneurial mentors in 4D Maker Space (Creating Class), of which two are off-campus supervisors, and 13 various entrepreneurial activities were organized here. In addition, it got a total of 5 Silver Prizes and 14 bronze Prizes in various provincial, municipal, school and district competitions, and more than 200 students participated in the competition.

From the data above, it can be seen that the entrepreneurial practice platform at the branch level is very grounded. The characteristics of small as well as beautiful, and low entry barriers also make it a pioneer with a broad spectrum of entrepreneurial education. At the same time, the integration of professional features also fully stimulates the enthusiasm for the participation of professional teachers and professional students.

B. *Entrepreneurship Practice Base at the School Level*

The entrepreneurship practice platform at the school level encourages students to form entrepreneur teams across branches, and has certain requirements for entering. It also requires that the entrepreneurial project must be related to departments of the college to some extent. The feature takes full account of the problem whether students can apply the profession to practice. The School Entrepreneurship Practice Base has a total of more than 20 business entrepreneurial incubation rooms along the street. Incubation rooms provide basic facilities such as unified decoration and unified networks installation, and offer certain financial support for the entering projects. At present, 20 student entrepreneurial

projects have entered into the first phase of Entrepreneurship Practice Base, most of which were teams that have been set up across branches. It made it possible that students of different majors were combined to improve the rationality of team building. Before each project is stationed, it is required to carry out a project roadshow and accept site assessment of the experts inside and outside the school. The measure not only raised the entry threshold, but also improved the quality of the entering projects. After entering in the base, the Entrepreneurship Practice Base also has subsequent track and services. The tracking content mainly includes the inspection of entering business condition, the use of the infrastructure, and whether there are security risks; the service content mainly includes business registration, policy consultation, activity approval, etc.. Since the establishment in 2016, the entrepreneurial practice base has achieved 20 registered individuals, and 5 of them transferring from the individual to company; it got 5 first prizes, 7 second prizes, and 11 third prizes in various provincial and municipal competitions, and organized more than 20 activities including entrepreneurship lectures and outing visits. In 2017, it was also qualified for municipal college student Innovation Park in Shaoxing.

C. Maker Space at the Level of School-enterprise Cooperation

The level broke the ivory-tower entrepreneurial practice and allowed entrepreneurial projects to get closer to the business environment.

Based on the geographical advantage of the Shaoxing Industrial Design Base, Zhejiang Industry Polytechnic College encourages creative and innovative student teams to enter into Shaoxing Industrial Design Base. On the one hand, the entrepreneurial project of the student team can become the second echelon of serving for base construction and the companies settled; on the other hand, the student team can not only obtain economic benefits but also more importantly gain entrepreneurial experience in the process of serving for base and the enterprises.

In addition, the maker space of Shaoxing Industrial Design Base also links with the maker space of departments and the school business practice base. Generally speaking, the threshold for entering the industrial design base of Shaoxing is relatively higher, and only the projects of corporate system can acquire the qualification for entry. However, this is relatively difficult for students, so Shaoxing Industrial design base has set up a green channel that only teams having obtained the title of "High-quality Project" in the maker space of departments and college entrepreneurial practice base can enter into. The office space and infrastructure provided by the Shaoxing Industrial Design Base for the Project of Green Passage are lower than the normal settled projects both in the area and quantity, because it is necessary to motivate the entrepreneurial team to have cost consciousness and spirit of hard struggle. If the projects pass later evaluation, a larger range of entrepreneurial resources can be obtained. Up to now, Shaoxing Industrial Design Base has absorbed 3 undergraduate entrepreneurial projects directly and 7 indirectly, appointed 7 base

entrepreneur-enterprise mentors, and established an international cooperation platform.

D. Industrial Parks at the Level of Local Governments or Enterprises outside School

After all, entrepreneurial resource and services that provided by colleges and universities are limited. What's more, the quality of an entrepreneurial project ultimately depends on the degree of market recognition. In order to promote the landing of college students' entrepreneurial projects better, link with local economic development and industries, and improve the employment quality of college graduates, Zhejiang Industry Polytechnic College is closely linked to maker space of Yee kuk club and Guanyou E-commerce Industrial Park across administrative area, etc., aiming to promote students' high-quality entrepreneurial projects to the society, accept market tests, and make the entrepreneurial resources and market information smooth. Up to now, a total of eight projects have settled in various industrial parks and the market has responded well, which laid the foundation for the next linking with industrial parks in other areas.

VI. CONCLUSION

The formation of innovation and entrepreneurship education model in higher vocational colleges is inseparable from the experience of undergraduate universities, but it is also necessary to explore different educational models according to their own characteristics.

The four-dimensional innovation and entrepreneurship education model of Zhejiang Industry Polytechnic College has been initially formed. In short, it is a four-dimensional model of full participation of four groups, share and innovation of four platforms, positive interaction in teaching on four levels, and positive progress on four levels of practice. However, the model still has some problems such as the lack of depth in knowledge of innovation and entrepreneurship at the content level, lack of experience and practice at the teacher level, inadequate integration of the professional skills at the practical level, and insufficient integration at the platform construction level. It's believed that how to solve the problems above is a common problem faced by most colleges and universities. Failure to solve these problems may cause no breakthroughs in innovation and entrepreneurship education in higher vocational colleges.

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