Research on Countermeasures of Makerspace Development in Guangdong Colleges and Universities Under the Perspective of Industry-Education Synergy

Jian Dong[1], Yintong Guo[2], and Jianru Xie[3](✉)

[1] School of Management, Guangdong Food and Drug Vocational College, Guangzhou 510520, Guangdong, China
[2] Health Management and Biotechnology School, Guangdong Food and Drug Vocational College, Guangzhou 510520, Guangdong, China
[3] School of Accounting Department, Guangdong Polytechnic of Water Resources and Electric Engineering, Guangzhou 510635, Guangdong, China
xiejr_gz@126.com

Abstract. Makerspace in colleges and universities is booming along with "mass entrepreneurship and innovation", but there are also many problems. To further promote the development of crowdsourcing spaces in Guangdong universities, it is necessary to conduct an in-depth analysis of its connotation. Based on the data study, the shortcomings and trends of the development of university crowdsourcing spaces are sorted out, and finally, it is hoped to make suggestions for the further development of crowdsourcing spaces in Guangdong universities from the perspective of industry-education synergy.

Keywords: Industry-Education Synergy · makerspace in colleges and universities · development countermeasures

1 Introduction

Although there is a relatively complete innovation and entrepreneurship ecosystem in Guangdong Province, the number of makerspaces in colleges and universities has been increasing, becoming an important force in training innovative and entrepreneurial talents and serving regional economic and social development. However, in recent years, there are also problems such as the level of service specialization to be improved, the prominent phenomenon of homogenization of services, and the low effectiveness of innovation incubation. To further promote the development of makerspace in Guangdong colleges and universities and deepen the reform of innovation and entrepreneurship education, it is necessary to study the countermeasures to focus on improving its professional service capacity and achieving new development, thereby providing a reference for promoting the development of makerspace in Guangdong colleges and universities.

L. F. Ying et al. (Eds.): ICELA 2022, ASSEHR 730, pp. 627–632, 2023.
https://doi.org/10.2991/978-2-38476-004-6_77

2 The Connotation and Positioning of Makerspace in Colleges and Universities

The makerspace in China's colleges and universities is a product of the close combination of industry-university research innovation in the era of "Mass entrepreneurship and innovation", which is an open, whole-factor and multi-functional practice carrier that serves innovation and entrepreneurship in colleges and universities with colleges and universities as the main body and cooperates with government, enterprises and other social bodies. It has the basic characteristics of public welfare, autonomy and cooperation, and should have a functional positioning that is more in line with the law of development of higher education and the law of cultivation of innovation and entrepreneurship talents [1].

2.1 Non-profit Service Platform for Innovation and Entrepreneurship

The makerspace of the colleges and universities is an effective carrier and useful extension to serve the cultivation of innovative and entrepreneurial talents in the school. It can provide free courses for the incoming innovative projects and entrepreneurial teams, equipped with certain support funds at no cost, and provide free physical space and hardware facilities such as office space, network, office equipment, etc. It is an important position for cultivating innovative and entrepreneurial talents.

2.2 Innovative Talent Development Zone

Colleges and universities rely on makerspace to adhere to the main line of innovation and entrepreneurship education reform and explore the effective path of cultivating science and technology innovation talents in practice. They try to use multiple types of flexible teaching organization forms, gather resources in multiple channels to form a new teaching environment, organically combine the characteristics and wishes of students, highlight the interdisciplinary and multi-disciplinary integration for talent cultivation, create a good ecosystem for innovation and entrepreneurship activities, and provide a model reference for the cultivation of various types of innovative and entrepreneurial talents [2].

2.3 Resource Gathering Place for All Whole-Factor of Innovation and Entrepreneurship

Makerspace of colleges and universities integrates on-campus sources to establish innovation and entrepreneurship training entities, aggregates markets and industries to promote the opening and sharing of scientific and technological resources, promotes collaborative innovation among industries, universities and research institutes, and jointly establishes a team of instructors for entrepreneurship practice to create a better environment for innovation and entrepreneurship of teachers and students, and cultivates innovative and entrepreneurial talents that meet the needs of economic and social development in Guangdong.

3 Deficiencies in the Development of Makerspace in Colleges and Universities

3.1 Innovation Value Disconnected from Industry

Researchers in colleges and universities are keen to obtain government project support, publish papers, and obtain various government award titles, so as to complete their assessment in schools and improve their titles, while they are not concerned about whether they can be transformed and how much they can be transformed. Insufficient investment in the transformation of results and neglect of market application and industrialization needs lead to the "impracticality" of the transformation of most scientific research results and limited effectiveness in improving the economic benefits of industry in Guangdong [3].

3.2 Inadequate Organizational Mechanism

The management of innovation and entrepreneurship resources in colleges and universities often involves many different departments and does not form a multi-linked, united construction force, for a lack of diverse and efficient cooperation mechanisms, a shortage of effective integration with regional industries, insufficient interdisciplinary cooperation and communication, insufficient industrial focus, and lack of a high-level coordinating organization, which leads to the embarrassing situation of multiple management and low efficiency of communication and coordination.

3.3 Lack of Resource Sharing Mechanism

The construction of makerspace in colleges and universities is an important part of the social innovation and entrepreneurship ecosystem. However, the implementation and curriculum design of maker education in colleges and universities fail to effectively match the market demand and the effectiveness is insufficient, [1] resulting in the lack of impetus for social innovation and entrepreneurship activities of makerspace in colleges and universities. The makerspace in colleges and universities does not make full use of on-campus innovation and entrepreneurship resources, is relatively alienated from the regional maker community, lacks communication and interaction, has little interaction with the makerspace of other colleges and universities, and is even in a relatively isolated state, without fully exploring and utilizing the innovation and entrepreneurship resources inside and outside the makerspace of existing colleges and universities [4].

4 Strategies for the Development of Makerspace in Colleges and Universities

4.1 Building an Ecosphere of Resources for the Integration of Industry and Education

The makerspace of colleges and universities needs to integrate the multidimensional resource elements it relies on, such as government, colleges and universities, research

institutions, and enterprises, into the ecological network it builds, and embed the innovation service chain and network value chain into the stage heterogeneous needs of entrepreneurial subjects [5]. Further, it is attempted to improve the classification and assessment mechanism of colleges and universities, guide scientific and technical personnel to focus on teaching, research, and transformation, strengthen the division of labor and collaboration, and increase the weight of guiding innovation and entrepreneurship projects as scientific research performance appraisal. To strengthen the market-oriented of the project, when science and technology management departments carry out project approval and top-level design for application R&D projects, they should take enterprise demand as the leading factor, promote the transfer and transformation of scientific and technological achievements as the core, and closely focus on industrial development, especially the development of emerging industries [6].

4.2 Introduction of the Market-Based Entrepreneurial Service Team

The makerspace of colleges and universities takes the improvement of education quality as the standard and integrates the concept of integration of industry and education into the talent training system. It is available to jointly build the makerspace and share policies, resources and achievements by introducing social professional makerspace, technology business incubator, university science and technology park, entrepreneurship park and other management service organizations in a collaborative mode of industry and education, thus forming a market-oriented entrepreneurship service team. It is suggested to introduce a third-party innovation and entrepreneurship education evaluation agency to develop an evaluation system for the makerspace of colleges and universities and develop annual innovation and entrepreneurship quality reports, etc. [7].

4.3 Promoting the Shared Development of Makerspace in Regional Colleges and Universities

Based on the common vision and strategic goals, following the principles of voluntariness, equality, resource sharing, interoperability and synergistic development, a synergistic sharing mechanism is formed in the field of science and technology innovation cooperation among universities in the Guangdong-Hong Kong-Macao Greater Bay Area, and a strategic alliance of university crowdsourcing spaces in the Guangdong-Hong Kong-Macao Greater Bay Area constructed to coordinate the cooperation and development of regional university crowdsourcing spaces, improve the cross-regional consultation mechanism, promote the free flow of innovation factors and innovation subjects among universities in Guangdong-Hong Kong-Macao cross-regional cooperation, and build a highly open ecological environment for innovation and entrepreneurship [8].

5 Conclusion

The makerspace in colleges and universities is of great significance to the work of “mass entrepreneurship and innovation”, and major colleges and universities are actively responding to the national call to promote the construction of innovation and

entrepreneurship education schools, which has played a very important role in promoting and facilitating the development of national economic transformation, inheriting and cultivating the culture of innovation and entrepreneurship in colleges and universities, and stimulating the vitality of innovation and entrepreneurship in society and the market [9].

Project Funds. Guangdong Food and Drug Vocational College "Double High Plan" project (No.: SG03-02.6). Guangdong Food and Drug Vocational College Humanities and Social Science Research Project (No.: 2019RW01).

References

1. Huang X.Y. Research on the Effectiveness of Makerspace in Colleges and Universities——Taking "Dongchuang Space" of Northeastern University as an Example [J]. Theoretical Research and Practice of Innovation and Entrepreneurship. 2022,5(10):194-198
2. Huo K., Yang Y.J. Research on the Construction of the Ecosystem of Makerspace Education in Colleges and Universities [J]. Hunan Packaging. 2022,37(04):171-173
3. Zhang Y.G., Zhang C., Wang J.M. Evolutionary Logic and Path Optimization of Makerspace Innovation and Development in Colleges and Universities - Based on the Perspective of Platform Theory [J]. Research on Science and Technology Management. 2021,41(17):69-77
4. 5. Zhang Y.G. The Operation Mechanism and Construction Strategy of Makerspace in Colleges and Universities--Taking the National Makerspace of Guangdong University of Technology as an Example [J]. Research on Science and Technology Management. 2017,37(13):101-106
5. Chen Z.W. Exploration on Cultivation of Makerspace Experiential Innovation and Entrepreneurship Talents in Colleges and Universities under the Perspective of System Thinking [J]. Journal of System Science. 2023, (01): 126–129+136
6. 7. Wang T., Luo K.F., Yang Y.K. Empirical Analysis on the Relationship Between Makerspace Incubation Capacity and Economic Growth [J]. Statistics and Decision Making. 2022,(22):108-113
7. 8. Chai C.X., Cui X.M. Research Hotspots and Frontier Evolution of Makerspace - Visual Analysis Based on CiteSpace [J]. Research on Science and Technology Management. 2021,41(12):177-186
8. 9. Wang Y.X. Research on the Development Strategy of Makerspace in Colleges and Universities under the Background of Guangdong-Hong Kong-Macao Greater Bay Area Construction [J]. Research on Science and Technology Management. 2019,39(24):72-77
9. 10. Zhang Y.G. Construction Practice and Development Path of Makerspace in Colleges and Universities--Taking the Construction Practice of Makerspace in Guangdong University of Technology as an Example [J]. Chinese University Technology Transfer. 2017,(07):81-83