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# Realistic Significance and Measures for Higher Vocational Colleges to Create “Makerspaces for Public Welfare”

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## Abstract

Against the background that “mass entrepreneurship and innovation” has become a national strategy, a trend of entrepreneurship and innovation has enjoyed great development in China. “Makerspaces for public welfare”, as a “spatial carriers” for “makers” aims to create and share their works, playing a positive roles in supporting and promoting the growth of “maker cultures”. Compared with other types of universities, Chinese higher vocational colleges are fairly suitable for the implementation of “maker activities” in view of their teaching forms, spatial layout and educational resources. Active creation of “makerspaces for public welfare” is carried out as an important innovation for Chinese higher vocational colleges to facilitate regional economic development.

## Keywords

Higher Vocational Colleges, Public Welfare, Makerspace.

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## 1. Introduction

A Project for Teaching Reform of Higher Education in Zhejiang Province in 2016 titled Research on Cultivating Talents with Creative Techniques and Skills in Higher Vocational Colleges--A Case of Business Administration numbered JG20160290; 2017 Wenzhou Philosophy and Social Science Program titled Research on Creative Development Strategies for Higher Vocational Education Based on “Strategies about 8 Advantages and 8 Measures”, No.17wsk142.

## 2. Creation Backgrounds of Makerspace for Public Welfare

“Makers” refer to the people who make efforts to turn their ideas into realities for personal interests and hobbies. In 2014, “makerspace” was listed in the American “NMC Horizon Report” (basic education edition) as one of 12 key technologies that would impact basic education in the coming 5 years. Premier Li Keqiang also proposed the concept of makers at the National People’s Congress of the People’s Republic of China and the Chinese People’s Political Consultative Conference. He incorporated the implications of Mass entrepreneurship and innovation into the definition of makers. As a result, makers suddenly have become a buzzword in different industries. Characterized by non-profitability and social benefits, “makerspaces for public welfare” is playing a part in supporting and facilitating development of “maker cultures” as a crucial “spatial carriers” for “makers” to create and share works. So far, there has been almost 1,000 “makerspaces for public welfare” abroad. The creation of “makerspaces for public welfare” is of great significance for the cities’ innovation and growth. Having successfully promoted the emergence of some creative products, the makerspaces for public welfare have become a driver to regional entrepreneurship and innovation. Actively getting involved in creating “makerspaces for public welfare” is a critical and creative measure to regulate Chinese higher vocational colleges to enhance regional economic growth and support national strategies.

### **3. Realistic Significance of Higher Vocational Colleges to Create “Makerspaces for Public Welfare”**

#### **3.1 “Makerspaces for public welfare” is a big helper to create favourable atmosphere for innovation and entrepreneurship, particularly for the expansion of these innovations.**

Over the past 5 years, China has witnessed the rapidly-extended distribution of higher vocational colleges all over the country. To be specific, there are more than 630 higher vocational colleges have been established in the prefecture-level cities and areas at lower levels. In addition, approximately 200 higher vocational colleges are set up in the prefecture level ones; besides, over 150 higher vocational colleges are distributed in different clusters with more suitable layout for social development and regional economy. In particular, the commitments have accommodated the needs for economic growth in those third-tier and prefecture-level cities. To deal with the reality of the downwards of higher vocational colleges in terms of distribution, they provide grassroots entrepreneurs with growth environment at relatively low costs. That is how we can create “makerspaces for public welfare”, which are open to the general public, and making some services available free of charge. The “makerspaces for public welfare” can build a bridge between “makers” and “entrepreneurship”, thus effectively supporting the strategies for “mass entrepreneurship and innovation”. On the other hand, “Makers” product ideas might be commercial as well, although they seemingly come into makers’ mind based on personal interests. A variety of ideas are turned into product prototypes within the “makerspaces for public welfare”, while some excellent prototypes still hold certain market potential. Supported by all-round entrepreneurship service systems within the context of the “makerspaces for public welfare”, “makers” are allowed to seize the chance to realize the transition into “entrepreneurship”, which has been verified to be feasible with the help of the “makerspaces for public welfare” in Europe and America.

#### **3.2 “Makerspaces for public welfare” will influence and even impact traditional Chinese manufacturing in terms of the ideas for new product research & development and market competitions.**

On the other hand, China’s traditional manufacturing industry includes some enterprises which is still lagging behind foreign countries in a majority of products. However, lacking for the motivation to engage in autonomous research and development, in most cases, will bring about the reality that a number of small and medium-sized enterprises have been used to getting involved in market competitions merely with low quality or low prices. According to the corresponding statistics, the proportion of Chinese enterprises carrying out innovations is below the average level of 27 European Union countries. That is to say, Chinese enterprises still fall behind in the aspects of their investments in innovations and outcomes, as a result of lacking in adequate profits from technological innovations. Apart from the adequate motivations and talents, poor thinking and innovation sense also constitute the prominent factors interfering Chinese enterprises’ innovation. “Makers” design and makers are interacting with their users intensively, who know well the demands of the particular groups more accurately. That means it is just a shortcoming of traditional Chinese manufacturing. “Makers”, who are concerned about “making ultimate pursuits for product quality and innovations”, can be critical to the improvement, acceleration and transformation of Chinese industries. For the purpose of innovation, it is suggested that the enterprises should first update their thinking mode for the creation. As a new thinking mode is different from the traditional one, maker mind-sets is able to harvest a highlighted innovative creation, problem awareness, mediation and criticism. Hence, the new driving forces will be stimulated and provided to transform and upgrade Chinese manufacturing if the “maker” mind-set are popularized and spread in the system of Chinese manufacturing with the created “makerspaces for public welfare”.

### **3.3 The creation of “makerspaces for public welfare” will be an effective factor to promote the more integrated transformation of higher vocational colleges’ talent training models.**

The huge wave of industrial transformation and upgrade has realized the promotion of the development of higher vocational education towards a high realm. Therefore, it has been proved that higher vocational education is exerting more and more important roles in enhancing industrial transformations and upgrades. What’s more, its most distinctive characteristic lies in its direct association with economic production. For regional industrial transformations and upgrades, higher vocational colleges is able to fulfil the mission of fostering a group of talents for innovation and entrepreneurship with new technologies and incubating a range of scientific and technological small/micro-sized enterprises, particularly enterprises for manufacturing. As a consequence, “maker mindset”-based education has become a pressing requirement in the area of reformed teaching of higher vocational colleges. In comparison with other education types, Chinese higher vocational colleges can suit the demands of carrying out “maker activities” regardless of their teaching forms, spatial layout or practical training bases. That is how “makerspaces for public welfare”, higher vocational colleges can be created. On the one hand, the commitment can encourage students to innovate and create through such spaces by taking advantage of different resources like information technologies, in order to reduce the harm of standardized teaching and tests to personalized development of students. Through the “makerspaces for public welfare”, students are encouraged to have access to more new technologies, by which they can have personal ideas and consequently achieve personalized development. On the other hand, the “makerspaces for public welfare” are so special and compatible that they place an emphasis upon various integrations across disciplines and borders, meanwhile, providing new carriers for reforming courses of higher vocational education. In reforming professional talent training models, the “makerspaces for public welfare” are integrated into the practical teaching system, so as to “learn through innovations”. Maker cultures are combined with the spirit of craftsmanship based on the “makerspaces” of higher vocational colleges for the purpose of really improving their students’ capabilities of innovation and entrepreneurship and effectively accelerating and deepening their transformation of talent training models.

## **4. Main Measures for Higher Vocational Colleges to Create “Makerspaces for Public Welfare”**

### **4.1 Secondary and higher vocational colleges jointly encourage different market entities to get involved in shaping “makerspaces for public welfare”.**

Absolutely unlike large-scale intensive real estate constructions, the “makerspaces for public welfare” are open entrepreneurship ecosystems created without any facilities or resources. These spaces can be mainly made through two approaches. One is to take advantage of the existing practical training bases inside higher vocational colleges. Having achieved a new round of development for integrating teaching with industries and combining learning with work, Chinese higher vocational colleges have established the corresponding systems for their courses and practices in line with occupational orientations. Generally, in possession of the favourable spaces, hardware and facilities, they are equipped as on-site regional scientific research and innovation bases. Besides, secondary and higher vocational schools distributed in different areas and counties own practical training bases which are well equipped with teaching facilities. With relatively complete tools for makers, their practical training bases can be turned into completely open “makerspaces for public welfare” by slight reconstruction. The other channel is to support and encourage different market entities to take an active part in the space creation. That means encouraging the related enterprises and large technological enterprises to build branches of “makerspaces for public welfare” inside higher vocational colleges. Besides, encourage and support the existing hi-tech talents of enterprises and public institutions for

their creative ideas, aiming to improve the atmosphere for makers inside enterprises and public institutions. Through reconstruction, opening and joint efforts, an open makerspace system with a focus on higher vocational colleges (including scientific research institutes, vocational and technical colleges) and coverage of all cities, regions and counties in an area can come into being within a regional economic zone.

#### **4.2 Establish regional ecosystems for “makers” based on the “makerspaces for public welfare”.**

Governments ought to invest in building or sponsoring the relevant higher vocational colleges to build financing and incubation service platforms, particularly, levelling the platform for “crowdfunding” or cooperating with “crowdfunding” platforms to focus on promotions in higher vocational colleges. It is extremely difficult to seek funding support for “makers” from traditional financing channels. By raising funds or selling products on “crowdfunding” platforms, “makers” can obtain necessary funds to their further research and development or mass production, which are of great help to ultimately launch creative products in markets. Financing service platforms of higher vocational colleges favour small batch production of product prototypes with market potential, and manufacturers undertake well-received commodities from the financing service platforms in accordance with market feedbacks to get stronger, so that ecosystems integrating “makers’ spirits” and “maker cultures” can really take shape based on the “makerspaces for public welfare” at the colleges. Complete financing and incubation service platforms of those colleges are premises for benign operations of the “ecosystems for makers”, which are inseparable from substantial support of governments.

#### **4.3 Offer adequate hardware and resources to higher vocational colleges’ “makerspaces for public welfare”.**

Firstly, increase the operation efficiency of public services. As regards environment creation and public services, governments have to pay more attention and deliver more support to higher vocational colleges' "makerspaces for public welfare". Amidst this backdrop, a group of eligible “makerspaces for public welfare” will be authenticated in higher vocational colleges in virtue of the simplified industry & commerce registration formalities (including office registration for these spaces) and reduce registration barriers. Governments are also required to grant certain subsidies so as to lower “makers’” innovation costs, customize preferential policies for “makerspaces for public welfare”, thus easing the requirements for registering premises for mass innovation and promote centralized registration, so that entities of innovation and entrepreneurship, which cannot meet office work requirements or need no office work, can apply for registering their domiciles through the centralized registration for mass innovation.

Secondly, provide equipment for these colleges. In this regard, policies shall be released to support public service platforms, while the enterprises shall offer the accessible tools for equipment, research and development to the colleges, including such devices as electronic, digital processing equipment for industrial designs, 3D printing and tests and others. In this way, industry alliances of smart hardware can assist and provide corresponding services of mould opening, machining and manufacturing for makers.

Thirdly, build atmosphere for innovation and entrepreneurship. Governments are advised to grant relevant subsidies to higher vocational colleges to financially support their innovation and entrepreneurship activities, including innovation and entrepreneurship competitions and activity week. Regional science, technology and education management departments are supposed to be carried out further collaboration with higher vocational colleges to forge an atmosphere with “maker cultures” in which makers are encouraged to implement for students at different levels and students are allowed to foster their practical skills and enrich their knowledge within the “makerspaces for public welfare” so that makers can participate in more events to foster new forces for “makers” within areas.

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