



Designer's Personal Fabrication: Understand the Designers Who Learn 3D Printing Design in China

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Abstract. The main area of 3D printing is about material science, STEM education for kids, industrial engineering and applications in medical science in China. And a new wave of customized 3D printing application raises up in fashion, jewelry, food and furniture industry recently. More and more students who major in architecture and art want to turn their career into 3D printing design. Taking Xubrance's professional 3D printing designer workshop as a case study this paper presents the role of 3D printing designers to the massive change in the pattern of interactive computing. We find that designers who learning 3D printing design skill are taking it for personal development and success in career and startup. This self-driven learning purpose make designers as one kind of end user for 3D printing material, printers, software and training courses. At the meanwhile, these 3D printing designers are making new products for their own customers. It is 3D printing designer, not 3D printers, connecting the industry and the customers, and introduce new domain knowledge from end users into industry with customized 3D printing products, such as untrained end users can get one haute couture with design only could be seen in architecture before.

Keywords: 3D printing designer · Personal fabrication

1 Introduction

Although 3D printing is a technology with a history more than 30 years, the 3D printing technology is introduced into mainland China initiated by the new discourses of Chinese government for maker and innovation recently, mostly reported by media to be used in maker space as a makers' tool to create new products for users industrial and engineer-based prototyping. For this reason, first wave of users of 3D printing technology in China seem to be technical and professional users, such as grassroots maker, manufacturing factories and new technology company in China.

With the popularization of the Additive Manufacturing and the upgrading of the 3D printing materials, China government has taken 3D printing as one of national strategy [1]. According to media reports, in the new 2020 plan, it is hoped that the sales volume of the 3D printing industry would get a booming market of 2 billion RMB [2] will be reached.

More and more consumers accept the 3D printing products with strong demand for fashion, fan-entertainment, customized clothing, jewelry, food and other new computation. At the same time, personal manufacturing is also rising in China, and designers who are artists, architects and art designers start to move into 3D printing design industry bring the multi discipline dome knowledge into this area [3, 4].

China's manufacturing industry needs for 3D printing talents are more than 8 million [5]. With the upgrade of digital economy and new consuming industry, it is provides a great deal of space for the needs of 3D printing design talents.

This means that the design education needs to integrate into 3D printing design education as soon as possible, so that students in the design field can adapt to the needs of prospective employers in the future [6].

But the current 3D printing design education is mainly in primary and secondary schools' stem education [7] and hardware, additive manufacture industry, health, material and engineering area.

There are many studies on industrial and emerging-based design education, but the corresponding 3D printing education is less.

With the rise of customized design, 3D printing designers have become a hub for personal manufacture, without good 3D printing designers, customers could get introduced to new products printed by 3D printing technology [8].

This study was initiated in 2014–2015, where there was few professional 3D printing educational courses, and 3D printing designers has to learn 3D printing design technology mostly by themselves online. By the end of 2014, Xuberance, which is the first professional 3D printing company in China has made 13 workshops around the world.

This study hopes to provide a preliminary exploration to 1. Where does the designers come from when there's no enough academic training in this area? 2. What the motivation for these designers to learn 3D printing design? 3. Learning the 3D printing design has an impact on their careers. 4. 3D printing design education how to respond to talent needs.

What are the main features of the 3D printing designer in China? Chinese 3D printing designers have entered the industry for a number of opportunities, Chinese 3D printing designers, understanding of the industry.

2 Research Approach

This research uses mix-method, such as online questionnaire, multi-site ethnography in Wuhan and Shenzhen [9]. Researchers take part in 2 workshop with the designers in two cities [10]. 53 informants, most are young university students and new designers under the age of 25 (see Fig. 1), and 30 males and 23 females (see Fig. 2), who are interviewed with a semi-structure online questionnaire.

3 The Findings

This research found that 94.3% of the interviewees have a bachelor's degree, and they are from different disciplines, including art design, architecture, urban planning, electronics, mechanical engineering, sculpture, psychology and business management.

44 of them have taken Xubrance’s 3D printing design workshop. 35 of them are willing to take 3D printing design as a part-time job.

There were 39 of them, 22 males and 17 females, who were not engaged in 3D industry before the training, but after the training 31 of them were very interested in taking the job 3D printing designers, most of them also are architecture.

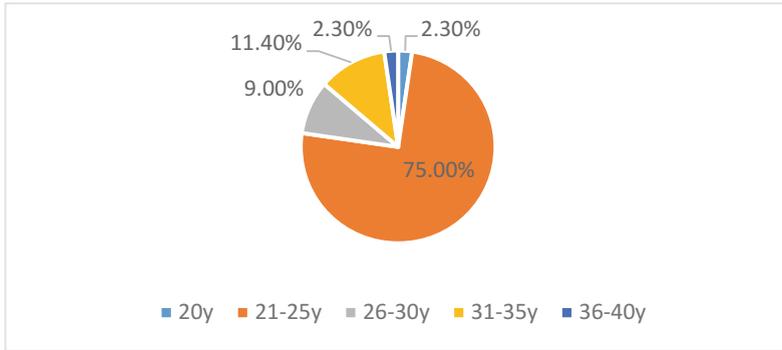


Fig. 1. Age riot of informants (n = 53)

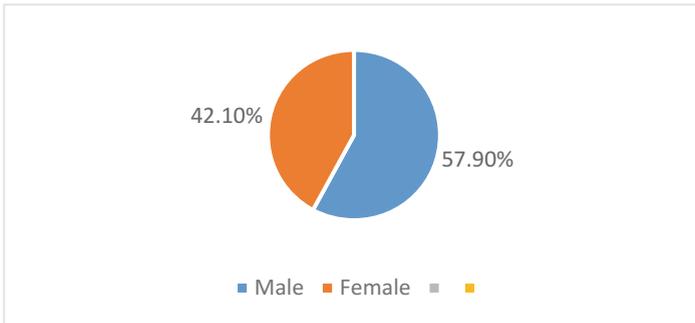


Fig. 2. Gender riot of informants (n = 53)

They are primarily interested in learning a 3D printing design to achieve “personal development”. They want to be able to build personal brands, increase revenue, or start their own business.

They mainly come from private companies and schools, and average annual income is less than 50,000 RMB, so most of them expect part-time jobs to work in 3D printing designs or build their own personal brand, and most of them want to increase annual income to full-time salary of 160,000–300,000 RMB, and part-time salary of 60,000–100,000 RMB.

The most important factors that influence the participant’s selection of training courses are form of workshop, mentors’ skill, cities, training fees, etc. Because they

already have some basic design courses in their major area, most young designers want to be able to learn the full-process curriculum and master level classes.



Fig. 3. Drop ceiling in a coffee shop in Shanghai, which is 3D printing designed with image of most famous buildings in the world (Designed by Steven Ma)

4 Conclusion

In this exploratory case studies, we found that:

1. Motivation for designers who learn 3D printing design is mainly related to their personal development need, such as ego trip and build their own brands.
2. Most of designers join this new 3D printing design industry is very young, and take their own domain knowledge [11] into this area, which take a domain knowledge flow from other discipline into 3D printing design, such as Steven Ma is trained as an architect, and then he brings architect's perspective into his 3D printing design works (see Fig. 3).
3. There is a need to increase interdisciplinary content across 3D printing design education curriculum.
4. It is designers who want to make their company and brands to do their personal fabrication, connecting the material industry and engineering-based products to the ending consumers.

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