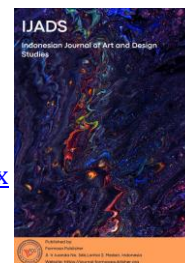


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Research on Design Thinking of Talent Training in Chinese Secondary Vocational Schools

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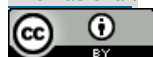
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ABSTRACT

This study aims at the model teaching of the integration of design thinking in the teaching practice of secondary vocational education, which requires the upgrading of clear talent training objectives, the optimization of teaching system and curriculum structure system, and the innovation of design thinking. The qualitative and quantitative research methods were used to obtain 46 students to participate in the curriculum research on the cultivation of design thinking. The students came from art and design students of Technicians College in Shao guan, Guangdong Province. The results show that design thinking plays a positive role in the cultivation of innovative talents in secondary vocational schools. In this experiment, students gradually explore and realize their own shortcomings according to the published tasks and strengthen their own abilities accordingly. Such as improving their imagination, analytical ability, understanding ability and observation ability. In addition, participants prefer to choose content that they are interested in or familiar with when choosing project topics. I also found that students who were not very serious in class would be very serious and focused when they met the content that they were interested in.

INTRODUCTION

Design thinking is an effective way to solve problems and the main means to cultivate students' creativity and innovation.

According to the literal content, many people will mistakenly think that design thinking is a thinking mode exclusive to the design field.

In fact, design thinking does not refer to specific design professional field. It can also be used in other fields.

This thinking mode was originally created by engineers, and the whole mode has strong operability, which is of great help to improve students' innovation and creativity.

Design thinking was developed in the 1950s. When Terman, dean of the School of Engineering at Stanford University, modeled the teaching model of the Bauhaus art School in Germany, encouraged students to innovate and start businesses and bring income to the school.

In order to realize this idea, he proposed the establishment of Stanford Industrial Park , Stanford Research and Development Park to the school. It was John Arnold who proposed the concept of "Design thinking" in 1959.

In 1969, Stanford University launched the first design thinking course on fostering creativity and innovation. This is where design thinking comes in.

After continuous development in the 1970s and 1980s, Design Thinking course of Stanford University has gradually become the most effective way for Stanford University to cultivate students' creativity, innovation and innovative thinking.

Much of today's model of design thinking is derived from Stanford University's standard model of innovative design thinking. The whole model is roughly divided into five stages. They are empathy, definition, prototyping, scheme establishment and testing.

(a) Empathy: Empathy can be understood as emotional communication, or as "emotional involvement". People in their work and life tend to think from the perspective of others when they

understand a certain thing or a certain program. If two people have the same education background, it is relatively easy to establish empathy; However, if there is a big difference in educational background and teaching background between the two, it will be relatively difficult to establish empathy. The one with a higher education needs to actively balance its own level at the level with a lower educational background, and trying to make the other side understand with the other side's way of expression. Of course, the content of empathy should not only take into account educational background and teaching background, but also try to perceive and understand others' feelings, emotions, thoughts and behaviors.

Therefore, in the process of experimental teaching, teachers should not only encourage the establishment of empathy between classmates, but also between teachers and students. The reason is that teachers and students themselves are in an unequal relationship, and it is difficult for students to open their hearts to communicate with teachers. Empathy can not only facilitate the communication between teachers and students, but also understand the most real psychological state of students through interviews and observation, so as to timely adjust the thinking training mode of the following definition.

(b) Definition: definition is an important part of design thinking. The content defined includes specific problems solved by the research topics, the specific division of work of team collaboration patterns. The specific areas of the problem focus and the collection of relevant data. For the students of this stage, the students need to be defined in two ways: The first is the critical question of the research and the accurate grasp of the key words. The second is the basic ability of the team members and the psychological expectations of the final work of the team.

(c) Establishing prototypes: The establishment of prototypes is the basis for the establishment of the program and is also a professional part of the detailed interpretation of the whole research

content. The prototypes that appear in design thinking include basic prototype, key prototype, dark horse prototype, Fangke prototype, functional prototype and final prototype. In the process of analysis, students should have a general understanding of the concept of each type of prototype and the correlation between prototypes.

(d) Program: The completion of the program is the trial of a variety of possible models on the basis of prototypes. At the present stage, most students in secondary vocational schools do not have the ability to design schemes. The reason is that the completion of the schemes requires participants to have certain creative ability and students to break the original thinking logic and inherent understanding, which is a certain difficulty for them.

(e) Testing: the process by which participants in the testing phase receive feedback on information. Those students who studied in secondary vocational schools mostly lacking ability is self-denial. Because they do not have certain judgment ability to choose which programs are acceptable and which are not. When the model is tested after completion, the students themselves, as the first users, do not know the use of the feedback information. Some students think that the feedback process is useless, which is a problem to be solved today.

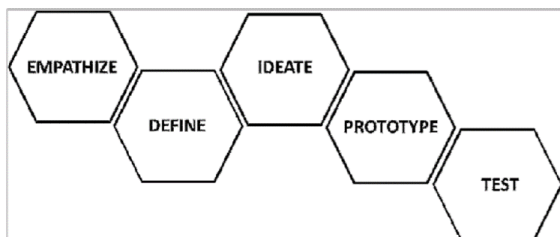


Figure 1: Basic model of design thinking in Stanford University

Current situation of education training in secondary vocational colleges in China

I . The basic concept of secondary vocational colleges

These schools are provided secondary vocational education. And their students receive secondary vocational education after graduation. Most of their students come from junior high school graduates or personnel with the same education as junior high school. Just like the students who came

from ordinary high schools. The basic length of schooling for students is three years. Secondary vocational education is vocational education carried out at the stage of high school education. Although secondary vocational education and high school education have certain similarities in curriculum arrangement, such as students need to learn mathematics, Chinese, English, physical education and other basic courses, secondary vocational education will add many professional courses on this basis and focus on them. For example, design-related majors in secondary vocational schools will arrange courses such as font design, composition foundation or packaging design. In regular high schools, there is no relevant curriculum.

Now the education of secondary vocational schools is the main source of vocational personnel training in our country. The mode of running secondary vocational schools is becoming increasingly close.

In the future, the state declares that it will gradually open the boundary of departments and promote the integration of various departments by means of reform, layout adjustment and resources integration. Secondary vocational colleges and universities include public and non-governmental ordinary technical secondary schools, adult technical secondary schools, vocational high schools, technical colleges and secondary vocational schools affiliated to institutions of higher learning.

II Curriculum Overview of secondary vocational schools

The goal of personnel training in secondary vocational education system is to cultivate professional and skilled personnel. Secondary vocational colleges are divided into mechanical colleges, agricultural colleges, cultural and art colleges and other colleges.

Most of the curriculum planning of secondary vocational colleges is based on the professional classification of higher vocational colleges and universities. This situation was resulting in the professional classification and curriculum arrangement of secondary vocational

colleges similar to comprehensive universities.

Of course, secondary vocational schools will call some strong majors as king majors according to their own development direction.

The overall core system of this kind of major is relatively complete, including a series of contents such as supporting skill teaching allocation, teacher allocation, internship arrangement and skill competition. These teaching advantages were assisted by comprehensive courses to jointly train talents.

However, those majors that are not very prominent in secondary vocational schools are called "fringe majors". But both ace majors and edge majors contain comprehensive courses in the curriculum mode of talent cultivation. The difference lies in that ace majors have richer comprehensive courses. The so-called comprehensive curriculum refers to the curriculum model formulated according to the direction of social and economic development and skilled personnel training.

The teaching purpose of comprehensive courses is to cultivate skilled talents, and the curriculum arrangement should be related to the ability and professional technology that students really need. So as to combine theory with practice. At present, secondary vocational colleges pay more attention to the training of technical personnel, so most of the curriculum arrangement is based on practical courses, theoretical training as a supplement.

At present, the comprehensive curriculum construction of secondary vocational schools can be roughly divided into four steps. The first step is to take the market development as a reference and analyze the latest form of the market. The second step is to adjust the course structure according to the development prospect of the future students' graduation. The third step is targeted to a certain type of post personnel training; The fourth step is to strengthen the understanding , application of the learning field and language design.

The construction and development of

comprehensive curriculum can be roughly divided into the following two stages:

The first stage is establishing a comprehensive curriculum framework. This part mainly attempts to summarize the content taught by a major or a department as a whole. Taking design profession as an example. Regardless of whether students major in graphic design or interior design, they need to have certain art foundation when learning design-related knowledge content. Therefore, sketch and color course can be set as the basic course of comprehensive curriculum framework. For example, plane composition, color composition and three-dimensional composition are the basic contents to help students quickly understand the way of doing a design project. And it is also appropriate to integrate them into the advanced courses of comprehensive courses.

The second stage is to develop a comprehensive curriculum plan. In this part, specific starting time and ending time should be given for each course within the comprehensive curriculum framework. Each teacher should confirm the approximate time of his or her course stage.

The third stage is the construction of comprehensive curriculum resources. This part not only includes the hardware facilities of secondary vocational schools, such as teaching facilities and practice facilities, but also includes the construction of teachers, learning equipment and environment, which is the premise for the implementation of comprehensive curriculum. Among them, learning materials are those that provide students with direct help, including working pages, operating instructions, reference books and enterprise technical materials.

III Problems in vocational education personnel training at the present stage

(a) Secondary vocational schools pay too much attention to the demand for talents at the technical level and neglect the development of thinking. At present, Chinese vocational education mode is mainly based on skill teaching, personnel training in the form of practical teaching and software teaching, so as to provide professional talents for

the society. However, due to the excessive emphasis on the technical level of students and the neglect of the cultivation of students' thinking, many students in secondary vocational schools now rely on teachers to a greater degree. It is difficult to analyze the subject content through independent thinking.

(b) Secondary vocational schools do not have a clear understanding of the future employment prospects of their students. From the perspective of employment analysis, the technical training mode of secondary vocational colleges can quickly obtain employment opportunities after graduation. To some extent, they have certain advantages. With the increasing work intensity in the later period, they need to constantly learn new technologies through self-learning ability.

These students of Vocational school can carry out form innovation, structure innovation and concept innovation on the basic model through innovation and creation ability to adapt to the changing market in the future.

However, most students in secondary vocational schools do not have these abilities. So that students gradually lose their original advantages during two to three years after graduation, and finally they will be eliminated.

(c) The theoretical knowledge of secondary vocational schools does not match the knowledge reserve and comprehensive quality of students. The teaching mode of secondary vocational colleges is closely related to that of higher vocational colleges and comprehensive colleges. So that most secondary vocational colleges directly refer to college knowledge textbooks when formulating textbooks and reference materials. Compared with undergraduate students, students in secondary vocational schools have a big gap in their art foundation, learning ability, understanding ability and teaching background. Therefore, it is difficult to understand textbooks designed for undergraduate students.

METHODS

This experimental study uses qualitative research and quantitative research to get conclusion. The preliminary researchers first carry out qualitative research to define the positive effect of design thinking on talent training in secondary vocational schools. According to the characteristics of design thinking and secondary vocational education, the researchers set up a teaching model suitable for the training of such talents. In the course of later experimental course education, researchers collect relevant data content of participants by means of data and draw conclusions.

(a) Upgrading and optimization of talent training objectives

Nowadays, most of the training modes of secondary vocational education are aimed at cultivating professional and technical talents. Taking art and design-related majors as an example, the basic idea of talent training for teachers in most secondary vocational schools is hoping that students can understand the basic uses and methods of design software. Finally they will be able to use it skillfully. The integration of design thinking requires re-examination and innovation of this talent training goal. It requires not only the cultivation of knowledge, skills and technology, but also the cultivation of students' independent learning ability, innovation and creation ability, understanding ability, communication ability and problem-solving ability.

Design thinking requires students to transfer situations through empathy in the learning process, understand the real demands of demanders and express them in creative ways, and realize the upgrading and optimization of talent training objectives through thinking guidance.

(b) Teaching optimization and curriculum model improvement

The most fundamental thing for design thinking to guide teaching innovation is that teachers should use design thinking to re-examine the knowledge and content system of the curriculum. Trying to sort out a curriculum structure framework that can be accepted by students of secondary vocational

schools according to the basic curriculum structure system.

Teachers need to make clear the correlation between core concepts, knowledge points and conceptual hierarchy in the framework. They should try to integrate the summarized knowledge framework into the model of design thinking, which should take into account students' understanding ability, learning ability, artistic foundation, age difference and other factors.

Whether in the restructuring of curriculum structure or the integration of design thinking and optimized curriculum framework. Teachers are required to have knowledge reserve and thinking understanding ability far beyond the course content, and have certain cross-border thinking. According to the model orientation of design thinking, teachers can complete the module connection of course learning demand, course objectives and learning content through phased learning. Ensure the orderly integration between the two.

(c) The basic model of talent training in secondary vocational schools under the guidance of innovative design thinking

Combining with the objectives of talent training and the content of teaching structure system optimization, this research puts forward the basic model of talent training in secondary vocational schools under the guidance of design thinking. The model is based on the innovative curriculum education thinking system with the design thinking guidance as the premise. Aiming the people-oriented, conceptual problem definition, students' own situation, teaching practice and other factors.

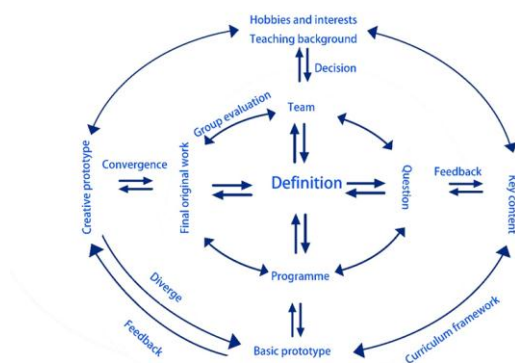


Figure 2: Design thinking model of this experimental study

DATA ANALYSIS

The main purpose of this study is to determine whether design curriculum arrangement under the guidance of design thinking can improve students' innovative and creative ability. The survey included 46 participants, 27 male and 19 female, with a general age range of 15 to 18 years. This study lasted for ten weeks, and the research methods used were qualitative and quantitative. Participants' occupations, education levels and interests helped determine the range of growth.

The whole experimental research is mainly divided into three stages, each stage is to redefine students:

In the first stage, the participants were initially defined by the researchers, which lasted about three weeks. In order to facilitate data collection. Firstly I asked all participants to form a team by themselves. The team form could be boys and girls playing together or boys and girls playing together. However, each group must explain the reason for forming a team clearly. Considering the number limit, it is decided that each group cannot be more than eight people, so there are eight groups in total. This purpose is to determine the appropriate experimental direction for each group through qualitative analysis by trying to understand their interests, abilities and other content.

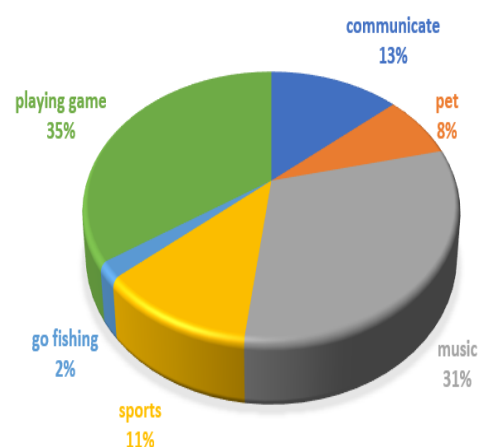


Figure 3: the percentage of interests

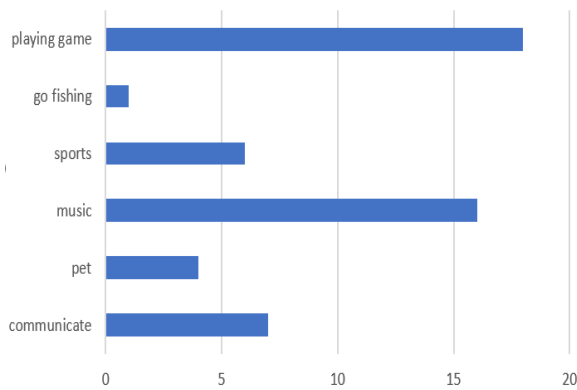


Figure 4 : the number of interesting

In the second phase, participants' abilities were redefined over a period of about three weeks. Based on the conclusions of the first stage, I determined the experimental direction for each group and planned experimental projects suitable for each group. Each project is designed specifically for the group and is designed specifically to improve one or more of the students' abilities. In this process, I will continue to track and observe each experimental group to understand the changes of students' thinking state at this stage.

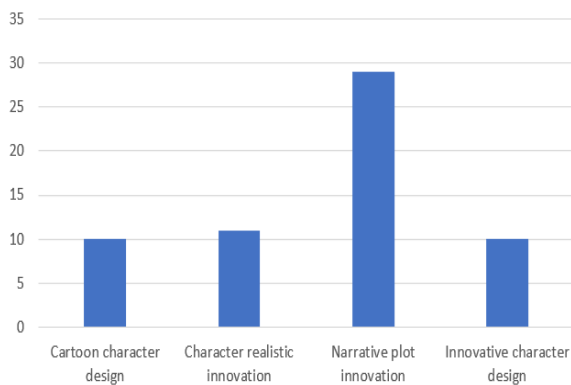


Figure 5: task allocation

The third stage is the extension and redefinition of the participants' abilities, which lasts about four weeks. This phase is mainly a test phase, each group will receive new experimental items. Compared with the second stage, this stage will be more freely. I will provide a general project type based on the performance of each group in the first two stages. As for the form, content, color and

elements, they can be freely expressed as long as they conform to the basic logic of composition. This process is to test the creativity and imagination of all the experimental groups. In this stage, I added a content to expand the abilities of individual students, such as further stimulating them when they have basic creativity and imagination, and trying to improve their other abilities.

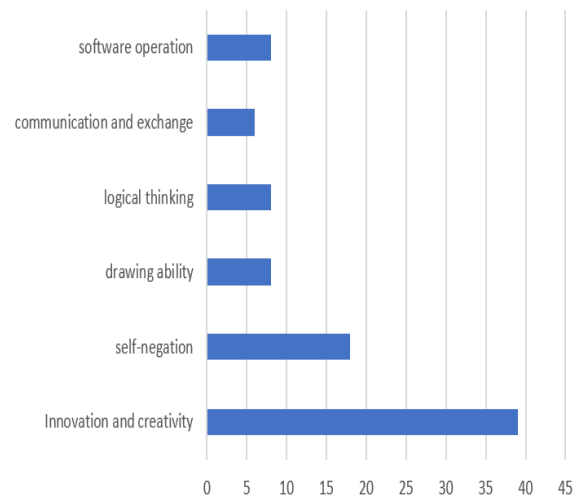


Figure 6: The number of improving ability

RESULTS AND DISCUSSION

It can be seen from the results of experimental courses that design thinking influences students in many ways. For the object of this experiment, design thinking is more to improve students' ability in a way of guidance and stimulation. The improved ability can be students' innovation ability in the face of design projects, communication ability between teams and so on. The main ability has a very different impact on students in different age groups. For students in secondary vocational schools aged 15-18, it is an important stage for them to improve their comprehensive quality. The enhancement of any kind of ability will have a huge impact on their future development. Researchers determine the impact of design thinking on participants based more on closely observing the changes in their behaviors in the experiment. For example, student A was unable to accurately extract keywords from design projects in the first stage, but in the third stage, he was able to quickly make some design schemes while trying new design projects. This

positive influence from scratch proves that design thinking is beneficial to students, and also proves that design thinking has a positive influence on training design professionals in secondary vocational schools.

CONCLUSION

Design thinking is a systematic idea, process, tool and method to guide the training of innovative talents in secondary vocational schools. In view of the problems such as immature training mode of innovative talents in secondary vocational schools, slow changing of teachers' thinking and insufficient understanding of curriculum knowledge. This research focuses on how design thinking innovates teaching and the teaching advantages of design thinking for talent training in secondary vocational education. The thinking mode constructs a basic model framework for innovative talent training of students in secondary vocational schools.

From the macro level, I have realized the improvement of teaching objectives and curriculum model, and from the micro level. I have changed the real demands and behaviors of my students. Design thinking guidance is a training mode for innovative talents. It not only trains students to analyze problems in a new thinking mode, but also changes teachers' teaching philosophy and optimizes teaching and curriculum structure. Of course, this mode of design thinking guidance needs practical guidance and continuous iterative process. Teachers also need to constantly update the model structure and optimize the design method according to different situations. This study aims to provide educational ideas for training innovative talents in secondary vocational schools, provide systematic ideas for teachers to better train students' self-learning ability, observation ability, innovation and creation ability, and provide an effective attempt for the reform of China's secondary vocational education in the future.

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