

Research on the Training Mode of Creative Thinking for Students Majoring in Design

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ABSTRACT

Students are an important group that will inherit traditional culture and continue to exert cultural value. This project focuses on how to promote students' creative and innovative thinking and ability. It is necessary to design experiments which related to the development of traditional culture, and analyze experimental data. This paper summarizes the effective mode of training students' innovative thinking and carries out the teaching reform in the specialized courses.

Keywords: design thinking ability, curriculum logic relation, traditional culture

I. INTRODUCTION

Some scholars believe that the elements of college students' ability to innovate thinking are as follows:

- The first one is innovative desire: curiosity, passion for inquiry, thirst for knowledge, interest in innovation, and desire to participate in innovative activities.
- The second is innovative ideas. With the advanced concept of innovation, the value, principle and mechanism of innovation will be well understood.
- The third is innovation observation. The ability to perceive things, that is, the ability to observe, analyze and reasoning, which can have good judgment of innovation opportunities and conditions.
- The fourth is innovative way of thinking: master certain scientific thinking methods, create the innovative potential from intuitive thinking, logical thinking, association thinking, divergent thinking, reverse thinking.
- The fifth is knowledge use of innovative methods: have a good understanding of the law

of innovation, master the necessary scientific knowledge, innovative knowledge, innovation skills, and have the ability to form a reasonable innovative idea or scheme. [1]

The research of scholars Lan Guohui and Chen Yashu mainly constructed four influence indicators including thinking optimization ability, learning digestion ability, knowledge reserve ability and scientific research and creativity ability; [2] The academic Wang Di constructs the index system of training and evaluating the innovation ability of college students from the four perspectives of talent, platform, system and culture. [3] This project builds the thinking ability index that college students need to realize the sustainable development of traditional culture in their study, including innovative thinking, innovative motivation, and innovation ability. Among them, innovative thinking refers to when the university students facing the traditional culture, they can creatively design the sustainable development programs through the knowledge and technology they have learned; Innovative motivation refers to when the college students facing the traditional culture forms, they can produce the desire of inheriting and developing them; Innovation ability refers to the ability to follow up on the implementation of the program after it was designed.

II. RESEARCH ON INITIATIVE OF INNOVATIVE THINKING

First of all, the research team on the setting of whether college students have a certain basis for creative thinking has preliminary research. The study will conduct using experimental methods. The theme of traditional culture design and development project is selected as the topic of the experiment. The project is

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aimed at new college students with a design background, selects a general design professional basic course, and designs a design task in the course; the design task is carried out in two ways:

The first way is not to give any guidance and hint to students, let students choose the direction of design research; the second way is to guide students, so that students can choose the subject of design in the traditional cultural field.

After the program was determined, the project chose the course *Design Aesthetics* as the course of experimental implementation, which is a basic theoretical course for the design profession, mainly to learn the general law of aesthetics. Two sessions were carried out, with 84 students in the first session and 60 in the second session. The first session of the design task is arranged as "Complete an interesting design topic research task", teachers do not give any guidance and hint to students, students' design research direction is entirely their independent choices. The second session of the design task is arranged as "An innovative design of an industrial product combined with cultural elements", and teachers will guide students to choose valuable cultural elements for subsequent development and design.

In the first session of the design task, 82 effective assignments were collected, and the subject matter was rich and varied, including 8 designs related to spontaneous attention to regional traditional culture, accounting for 9.76 %.

In the second session design task, 57 valid student assignments were received. All students have chosen different cultural elements to integrate with their product design. The category of cultural elements covers regional cultural expressions such as folk festivals, totems, etc., which are highly visual. The research team selects the third indicator of the three

innovative thinking indicators-the innovation ability to grade the assignments, and evaluates the subsequent developability of the design scheme. Three professional teachers with design backgrounds were selected for the project. Students' sample assignments were evaluated in accordance with the set criteria. Finally, the scores from three teachers were weighted and averaged to calculate the score of each student's creative ability. Then calculate the average score of each work, among which 90-100 districts are judged to have excellent innovation ability, 70-89 districts are judged to have better innovation ability, and 45-69 districts are judged to have A certain innovation ability is judged to be poor in creative ability in the interval below 45 points.

According to statistics, it is known that the level of students' innovation ability generally reaches 57.9%. Experiments show that freshmen with a design background have a certain degree of innovation ability, but the ability is insufficient.

Through the above comparative experiments, we can see that in the freshman of the design major background, because the design professional knowledge has not yet been systematically studied, although students have a certain creative thinking, they can also design a preliminary plan, but professional characters and follow-up the development ability of the program is low; in terms of innovation power, the proportion of students with a design background who independently develop and design traditional culture is low, and the teachers' conscious guidance can greatly improve the initiative of regional traditional culture development.

Through experiments on the creative thinking of freshmen with a background in design, we can know that among the indicators of thinking ability required for sustainable development of traditional culture, innovative thinking is weak, the motivation for innovation is low, and the capacity for innovation is insufficient. (See "Table I")

TABLE I. EVALUATION FORM OF STUDENTS' INNOVATION ABILITY

Score interval	<45	45-69	70-89	90-100
Number of samples	6	33	15	3
Ratio	10.53%	57.89%	26.32%	5.26%

Freshmen have not yet studied the design knowledge system systematically, which is the main reason leading to weak creative thinking; the expression ways, low sensitivity and insufficient interest in traditional cultural elements are the reasons for the low motivation for innovation. The lack of experience in expression is the main reason for the lack of innovation ability.

III. EXPERIMENTAL IMPLEMENTATION PROJECT

The first project is about the sustainable development of local languages and cultures in southern Fujian, China. This project mainly studies the Minnan language and culture in Minnan region of China, and carries out sustainable cultural design and development. [4]

The second project is about Chinese herbal medicine culture, and carries out sustainable cultural design and development. [5]

A. Data analysis

The project records the results of the development of the designated regional culture by the two teams within three years.

1) Analysis of the level of thinking ability: The authors evaluate students' works according to the three indicators of defining thinking ability. Among them, in terms of innovative thinking, the innovation of the

works developed by students is evaluated according to the percentage system; in terms of innovation ability, the follow-up developability of the works is also evaluated according to the percentage system. Three people with a professional background in designing graded the works at different stages, and finally added up the total score to calculate the average score, and obtained the data of the innovative thinking and ability of each team and each work.

From this we can see that in the design project, students' creative thinking and ability have been continuously improved. (See "Fig. 1" and "Fig. 2")

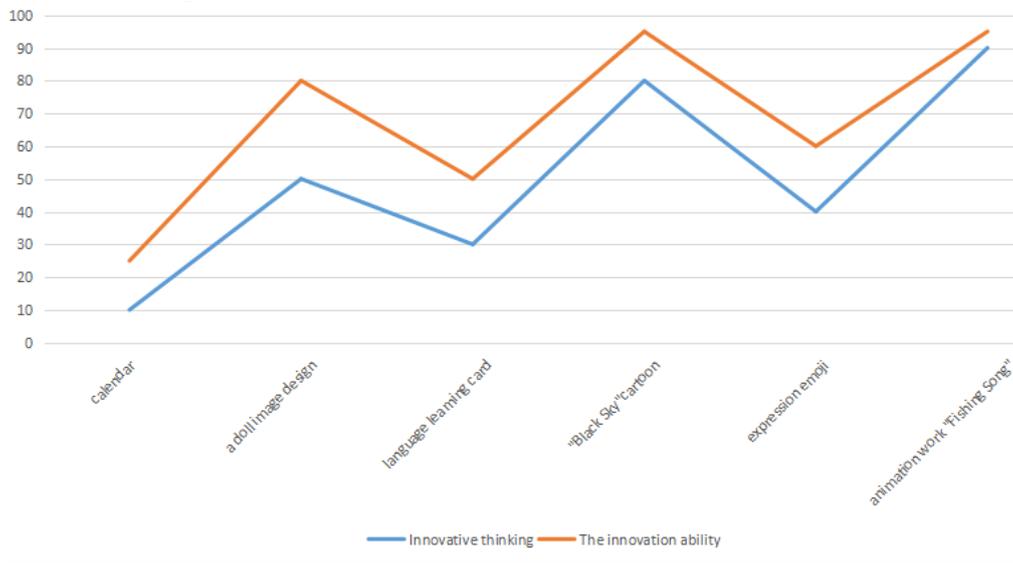


Fig. 1. Stage scores of local language and culture sustainable development projects in southern Fujian.

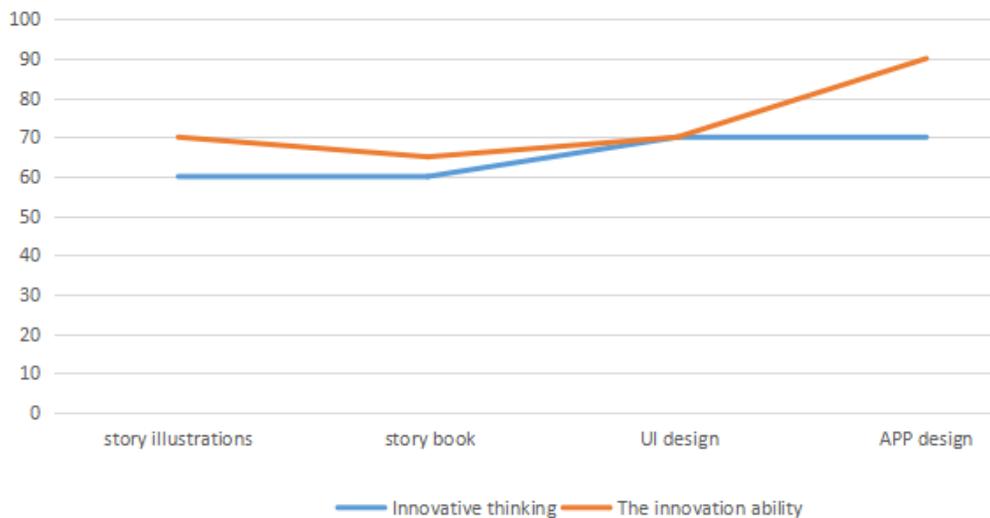


Fig. 2. Stage results of sustainable development of herbal culture.

Through the observation method, the mentors of the two projects recorded relevant information analysis of the mentoring process. It can be known that when the project was started, the design direction of the students was not clear, and a lot of time was invested in the technical choice of the scheme and design. With the progress of the project, the technical problems of design are also changing, but the choice of design schemes will be clearer. Students can find the entry point of their design relatively quickly. It can be seen that the driving force for innovation is also gradually improving.

2) *Sample analysis of non-project teams:* In the non-project team sample, there were 82 students. A statistical analysis of the graduation design works performed after three years of professional knowledge study shows that the design choices selected independently cover various fields such as life, society, ethics, technology and regional culture. Among them, there are 33 design topics related to traditional regional culture, accounting for 40.24%. It can be seen that the innovation motivation for the sustainable development of regional traditional culture is still relatively high. The design sample of the observation sample is the same as the experimental project, and the mentor is arranged to guide.

Finally, the design project results of the observation sample are evaluated, and the regional culture is selected as the observation sample of the development project. Similarly, three design background teachers were selected, and the scores were still divided into two categories: creative thinking and creative ability. The scores of the teacher team are summed up first and then averaged to get the average score of the individual's innovative thinking and innovation ability. Finally, the students' average thinking and innovation ability of this sample group are summed up to get the average, and the sample's creative thinking score and creative ability score will be obtained.

The two projects participating in the experiment were averaged by the design work scores of the last year, and the average score of the innovative thinking and the innovation ability of the experimental team was calculated.

The score interval and corresponding ability evaluation are still used: 90-100 districts are judged to be excellent; 70-89 districts are judged to be good; 45-69 districts are judged to be fair; intervals below 45 are judged to be poor. (See "Table II")

TABLE II. COMPARISON OF SCORES BETWEEN OBSERVATION SAMPLES AND PROJECT EXPERIMENTAL TEAMS

Evaluation point	Observation sample	Experiment project Sample
Creative Thinking	67.0	80
Creative Ability	62.0	92.5
Creative Force	47.56%	

It can be found that the observation samples of the non-participating projects, the innovative thinking and innovation ability of the regional traditional cultural development projects are at a general level; and the levels of the experimental project samples are in a good and excellent range.

In terms of creative force, comparing observational samples and the basis of innovative thinking in the course of *Design Aesthetics* with the experimental data of initiative, we can find that after three years of professional knowledge learning, students' initiative has been greatly improved.

B. Results

Through the above experiments, the following conclusions can be drawn:

For students participating in regional traditional culture experimental projects, the design methods and learning content are closely related. The improvement of their thinking ability will increase with the accumulation of professional knowledge.

During the experimental cycle, students who participated in the regional traditional culture experimental project have significantly improved their innovative thinking and innovative ability compared with the observation samples that did not participate in the experimental project.

IV. LOGICAL RELATION DESIGN OF DESIGN COURSES

Based on the above experimental conclusions, the research team designed a plan for cultivating the thinking ability of students majoring in design.

Combating the curriculum system of the design majors involved in the experiments and as observation samples. According to the technical means and professional knowledge involved in the phased results of the experimental project team, sort out the corresponding courses, and reorganize and strengthen the logical relationship of the courses. Gradually improve your thinking ability in a stepwise manner.

The technical means and knowledge involved in the phased results of the experimental project team can find basic knowledge and technology throughout. Therefore, the first stage should focus on the aesthetic rules of design, modeling capabilities and basic design

techniques. Therefore, there are mainly three types of courses: the first category is courses on studying aesthetics such as "Design Aesthetics" [6], "Audiovisual Language", and "Introduction to Design"; the second category is basic modeling courses "Design Sketch", "Design Color", "Sketch", and design basic courses such as "Three Components" and "Comprehensive Materials"; the third category is courses of various basic design technologies, such as graphic design, image processing, and animation production.

The second stage should focus on professional knowledge theory system and relatively complicated design techniques. This part has different requirements in different design professional directions. For example, in the field of graphic design, the professional knowledge courses that need to be mastered include

"Type Design", "Package Design", "Font Design" and "Poster Design". The professional skills mastered are photography, video editing, etc. In the field of digital media art, professional courses that need to be mastered include various basic courses such as "Animation Production Basics", "Split Script", "Script Creation" and "Virtual Reality". The professional skills that need to be mastered are photography, video editing, special effects, and game production.

It can be known from the experimental project that the third stage should focus on comprehensive and cross-cutting design knowledge, and improve the development capacity of regional traditional culture, for example, "Animation Creation Course", "Micro-Movie Creation Course" and "Interactive Product Design" and other courses. (See "Fig. 3")

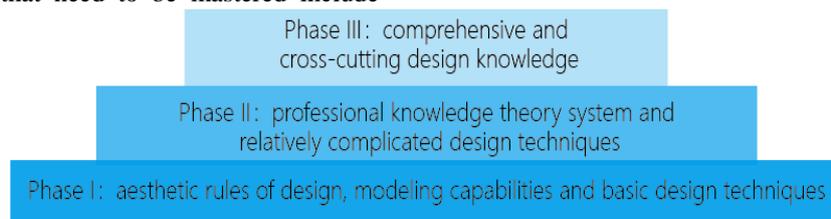


Fig. 3. Sorting out the logical relationship of the course.

V. CONCLUSION

The study found that students with a design major and a non-design major have a close attention to traditional regional culture without any training, and lack of motivation to innovate. Therefore, students with a more professional design background need to receive more targeted training in their professional fields to improve the effectiveness of traditional regional cultural development. By analyzing the data of the two experimental projects, it can be found that the teams participating in the regional traditional cultural development project have significantly improved their innovative thinking, innovation motivation and innovation ability than the observation samples that did not participate in the project experiment. Summarizing the law of thinking growth of the experimental project team, the research team designed a course teaching model for design majors, with the aim of improving their creative thinking capabilities.

References

[1] Li Cunjin, Yan Yongjing, Yang Qing. An Empirical Analysis of the Factors Affecting the Formation of College Students' Creative Thinking Ability [J]. *Technoeconomics*. Vol.32 No.3. March 2013.

[2] Lan Guohui, Chen Yashu. Research on the Evaluation of College Students' Innovation and Entrepreneurship under the Background of "Internet +" [J]. *Journal of Anhui University of*

Science and Technology (Social Science). Sep. 2017 Vol. 19 No. 5.

[3] Wang Di. Analysis on the model of factors for cultivating college students' innovative ability [J]. *Journal of Henan University of Technology (Social Science Edition)*, 2014 (4): 157-160.

[4] Jia Leilei. Constructing a National Cultural Image Compatible with Tradition and Contemporary Times [J]. *Journal of PLA Academy of Arts*. 2015 (2).

[5] Ouyang Lintao, Wang Suwei. Analysis of the Translation and Introduction of Traditional Chinese Medicine Culture from a Cross-cultural Perspective [J]. *Southeast Communication*. 08 August 2019

[6] This course and the follow-up courses mentioned below are all derived from the Digital Media Arts Professional Training Program of Xiamen Huasha University (2016-2019).