

Teaching Reform and Practice Research on "Display Preliminary Design"

A Basic Course of Design Major

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Abstract—At present, undergraduate teaching system of various universities' design major involves the course of "preliminary design" in professional basic education, seeking to build a solid core of this major with connecting function in design art teaching system. It aims at making students have a general knowledge about basic knowledge of design and master relevant basic presentation techniques of design through learning of this course and lay a good foundation for future course study and practical project design of design major. However, due to subdivision subject of design major and various universities' different emphasis point in teaching, teaching methods and practice content of this kind of course are different, making it impossible to widely apply and demonstrate. Therefore, with several years' teaching practice, our department conducts reform in the two directions of "display preliminary design" and "product preliminary design" and has obtained preliminary result, having important enlightenment and education effect on students' recognition, knowing and practicing of design. This paper emphasizes on using teaching practice of "display preliminary design" to explain how to gradually perfect teaching method and research in course reform.

Keywords—design; display preliminary design; teaching practice; design education

I. ORIGINAL PURPOSE OF ESTABLISHING CORE COURSE SYSTEM OF "PRELIMINARY DESIGN"

A. Background of Course System Construction

1) New requirement of major development after discipline classification.

In Administrative Regulations on Undergraduate Major Setup in General Institutes of Higher Education, which is recently released by Ministry of Education, art theory is listed as discipline field for the first time. It will definitely encourage design subject under art theory category to take disciplinary development as its objective, enter into deeper professional research field and renew concept of design education.

2) New requirement of the major under new social background

In recent years, rapid development of economy and technology both at home and abroad puts forward many new requirements for design major. Design major has to constantly

innovate and reform in talent cultivation and education mode to adapt to requirement of social development.

3) New path of reform with experience of teaching practice

There is obvious defect in undergraduate course system's basic education in China's design major of various colleges and universities. Namely, the major lacks of a basic core course bearing connecting function. Therefore, as industrial design department, we attempted to conduct course construction of preliminary design 6 years ago, and carried out reform construction "Fig. 1" in the two directions of "display preliminary design" and "preliminary design of product". Several years' of teaching practice has achieved preliminary success. Focus of this course is professional portrayal, which is the first class for students to set foot in design, especially the course of "display preliminary design". Stereoscopic vision and space control run through the whole teaching process. Correct imparting and guidance will have important enlightenment and education effect on students' recognition of design, acknowledgment of design and practice design.

This course is divided into two coterminous links of Preliminary Design I and Preliminary Design II. One is to display preliminary design and the other is product preliminary design, carrying on to achieve completion of this major's teaching content and objective.

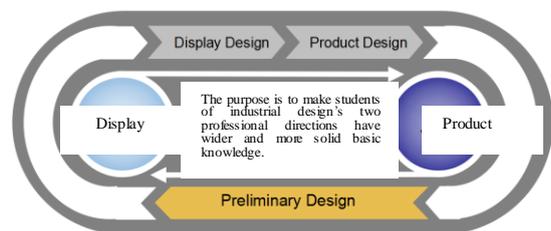


Fig. 1. Course construction of preliminary design

B. Function and Significance of Course System Construction

Regarding "preliminary design" as basic core course of design makes up for lack of professional teaching of "preliminary design" in design discipline(There is only relevant subject textbook counseling previously, like "elementary architecture" and "preliminary design of

landscape”), and becomes an important bridge between basic course and professional course.

As connective basic core course of the major, “preliminary design” has important enlightenment and education function on students’ recognition of design and practice design. Students can enter the role quickly and make great progress in ability of design innovation and professional practice.

The research will perfect course system construction of design: Multi-angle design recognition and basic training make teaching content more fulfilling and perfect. Thus, they provide strong support for students’ professional orientation and improvement of their design quality. The research will make cultivation of design talents more systematic, standard and operational in teaching system, having wide promotion and application value and demonstration effect.

II. EXPLORATION AND IMPLEMENTATION OF COURSE SYSTEM CONSTRUCTION SCHEME OF “DISPLAY PRELIMINARY DESIGN”

A. Specific Research Object and Content

After several years’ teaching practice, “display preliminary design” has accumulated some experience. Course construction will conduct carding and assessment on course content and practical training result, continuously carry on teaching reform and deep exploration on “display preliminary design” and solve the problem of professional portrayal. It is gradual exploration year by year and practice arrangement of course setup of “display preliminary design "Table I”.

TABLE I. GRADUAL EXPLORATION YEAR BY YEAR AND PRACTICE ARRANGEMENT OF COURSE SETUP OF “DISPLAY PRELIMINARY DESIGN”

Accumulating experience	Process one	Process two	Process three	Process four
After six years’ of teaching accumulation and attempt, from previous copy for reference to professional consolidation, then to current appropriate difficulty degree and emphasis on experience, students are not afraid of design. Instead, they know more about design, enjoy design and have pamper imagination about design.	Course content: Refer to cultivation mode of elementary architecture and preliminary design of art.	Course content: Simplify professional training mode in elementary architecture and emphasize on discipline features of industrial design.	Course content: Strengthen professional design features of display space on the basis of imparting basic knowledge.	Course content: Adjust difficulty degree and carry out basic practice and design with the help of authentic classroom space.
	Practice: Space design of dormitory(Easy inclination to decoration)	Practice: Public display design of teaching buildings(Easy inclination to single furniture)	Practice: Space design of special subject display(Difficult to find dimension reference)	Practice: Industrial design homework exhibition Space design
	Experiment grade: Grade 2009 and Grade 2010	Experiment grade: Grade 2011	Experiment grade: Grade 2012	Experiment grade: Grade 2013 and Grade 2014

Know about differences between and difficult points in “display preliminary design” and “preliminary design of product”. There are problems faced by two directions of preliminary design teaching “Fig. 2”; it is planning of research on solving the problem “Table II”. Pay attention to modification and compiling of handouts content of “display

preliminary design” course, especially deeper research, adjustment and renewal on concept, development history and current status, main research area, occupational knowledge system and professional skill quality training of design and other key contents with combination of era development.

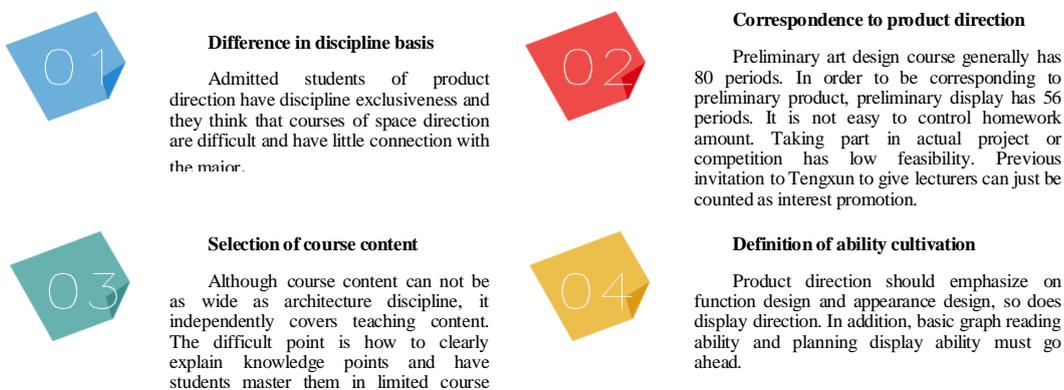


Fig. 2. Problems faced in teaching

TABLE II. THE PROCESS OF COURSE TEACHING

1	2	3	4
<ul style="list-style-type: none"> • Practical basis: • Freshmen in college only possess drawing presentation basis and simple spatial form cognition ability. • Antecedence course is fewer than preliminary product design in sophomore year. 	<ul style="list-style-type: none"> • Course linking: • Difficulty degree increases from theory cognition to two-dimension representation and three-dimensional consideration, therefore there should be appropriate linking. • It is also a difficult point to connect with the course of preliminary product design. 	<ul style="list-style-type: none"> • Content selection: • Overview, introduction of basic knowledge, representation skill training and introduction to design methods(with the help of authentic space). • Less decoration and pay attention to space. 	<ul style="list-style-type: none"> • Cultivation method: • According to characteristics of beginners, know about concept and basic method of design and make a manageable design with certain "functions".
Start from basic cognition and copy drawing	Cultivate students' confidence and interest in study	Lay stress on standardized drawing and spacial cognition ability	Start from monospace and repeatedly experience

Explore new cultivation mode of practical training of course teaching design. We aim to solve four parts of problems: What is design, how to make a design, basic procedure of design and general basic training for design. Task design should be professional and basic training oriented. At the same time, students can flexibly apply learned knowledge through the platform of our department's industrial design innovation and research center, expert instruction in this field, holding competition project and other practical links in and out of class, laying a good foundation for subsequent course study of this major.

B. Basic Purpose of Course Construction

The main objective is to continuously deepen and perfect course construction of "display preliminary design", encourage students to learn well in the first lesson of introduction to design with effective practical method and achieve excellent teaching results on the basis of previous teaching exploration with the help of analysis on basic education of design at home and abroad and combination with course system in the upstream and downstream.

This course's real purpose is to make students genuinely know about concept and basic method of design instead of making a "great design". We have a clear requirement, which is making a "manageable" design with certain "functions". It is required to pass the course and know about the whole set of design procedure, from receiving the task, analysis and topic selecting, doing market survey, conception, sketches, effect sketches or physical models to final introduction text. The

whole course emphasizes on feeling and experience, avoiding entering into a series of "technical traps".

C. Major Methods Used to Solve Teaching Problems

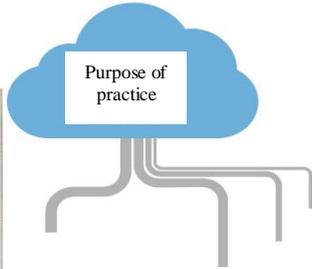
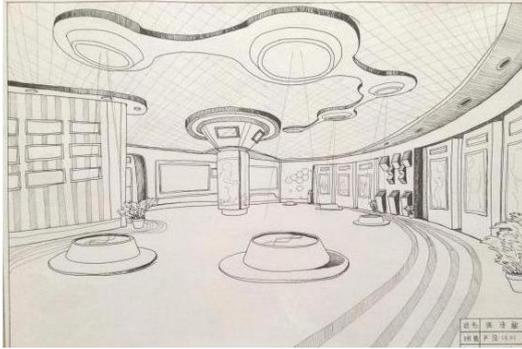
- Adopt systematic methods to construct course system of "display preliminary design". Mainly including: Design cognition, basic knowledge of design, design procedure and method, design and innovation cases and so on. Perfect the whole course system from application example to professional knowledge and from practical case to model extraction, and finally form a systematic and standardized teaching system "Fig. 3" to "Fig. 9" are teaching practice of a series of practical links in "display preliminary design".
- Intensify design of experiment link in course system: Add complexity design practice made by hand in course and adopt "student team mode of cross grade and course" at the same time to make students solve relevant problems together. During the process, each ability of students is improved.
- Open and research-based practical training: Combine with colleges and enterprises at home and abroad, use currently existed practice links, like college course practice at home and abroad, industry experts carrying out workshop and so on, and take cooperation research project as the content in order to expand students' international sight and train their project research ability and social adaptive ability and so on.

Current settings of basic exercise:

Fig. 3. Exercise 1: Basic lines

Current settings of basic exercise:

2. Single-line hand practice

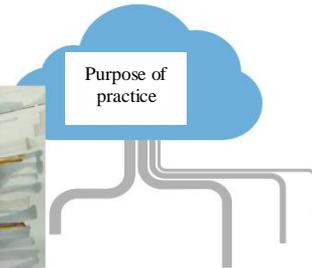


- Select existed excellent space display pictures by yourself and try to use single-line representation technique to display spacial layers by hand in order to better understand constitutional elements of display design.

Fig. 4. Exercise 2: Single-line hand

Current settings of basic exercise:

3. Representation of coloring by hand

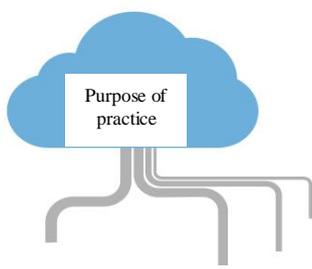
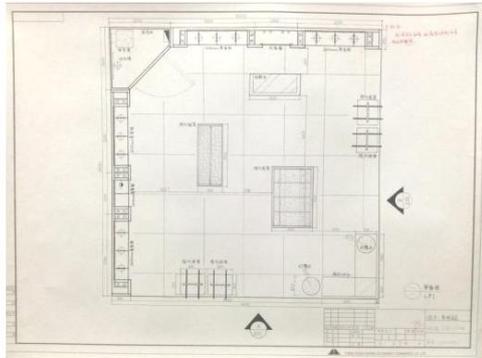


- Select one of the excellent space display pictures under research and evaluation, use single-line coloring technique to display spacial layer and quality representation of relevant background by hand, analyze on application of form beauty design method in displaying spacial graph, and strengthen understanding of comprehensive features of display design.

Fig. 5. Exercise 3: Coloring by hand

Current settings of basic exercise:

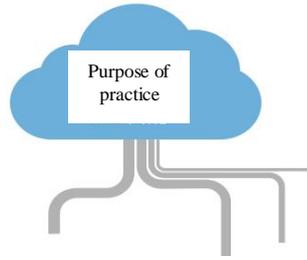
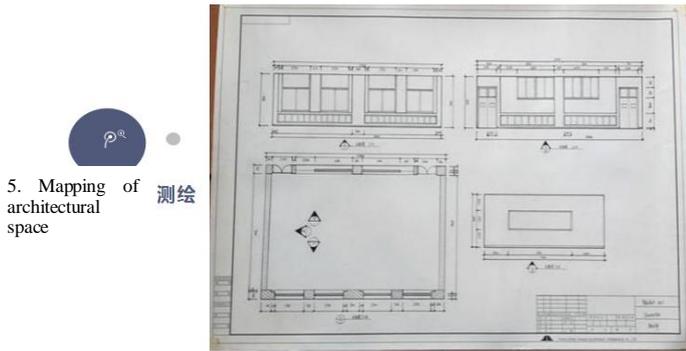
4. Standardized copy drawing of display space



- Strictly draw according to graph specification, practice drawing procedures(drafting and composition) and correct representation of plane graph, elevation and section drawing, correctly use legend, adopt technical lettering or artistic calligraphy orderly and uniformly. Lay foundations for official design.

Fig. 6. Exercise 4: Spacial copy drawing

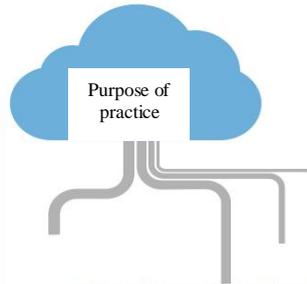
Current settings of basic exercise:



- Purpose of practice: Strictly obey measurement specification, conduct actual measure of classroom in different groups, correctly display measure data according to drawing procedure of engineering drawing, make plane and elevation drawing, adopt technical lettering or artistic calligraphy orderly and uniformly

Fig. 7. Exercise 5: Spacial mapping

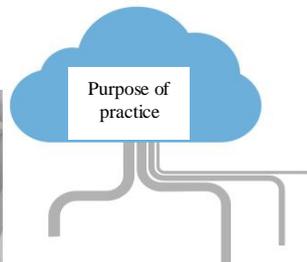
Current settings of basic exercise:



- Carefully analyze on task book of scheme design, determine conception and selection of scheme, deepen adjustment(the first sketch, the second sketch and decision on scheme), finally realize drawing representation of scheme design(plane, elevation and effect drawing)(required hand-drawing for all).

Fig. 8. Exercise 6-1: Space scheme

Current settings of basic exercise:



- Shrink the model by equal ratio(1:20) according to display design scheme determined in Exercise Eight 1 and size of design paper, and train sense of spatial dimension and operational ability.

- Use models instead of effect drawings to increase spacial cognition and avoid defected spacial presentation drawing of junior grade..

Fig. 9. Exercise 6-2: Spacial model

D. Anticipated Benefit and Practice Result Display of Course Construction Project

The course construction project has been carried out in our school's industry design major. At present, "preliminary design" course has been arranged in the two phases of the second term of freshman and the first term of sophomore year of industrial design department. The project completes modifications of relevant teaching content and compiling of teaching handouts, making teaching content more appropriate

for students' study need and practical training more suitable for students' need of basic learning and making it easier to improve students' enthusiasm of learning. Professional universality of project result makes it easier to extend to relevant discipline of design major of other colleges to promote students' professional cognitive ability and basic design ability.

There are displays of newest achievements of "display preliminary design" "Fig. 10" "Fig. 11" "Fig. 12".



Fig. 10. Displays of newest achievements of "display preliminary design"



Fig. 11. Displays of newest achievements of "display preliminary design"



Fig. 12. Displays of newest achievements of "display preliminary design"

III. FEATURES, INNOVATION AND PROMOTION APPLICATION VALUE OF COURSE SYSTEM CONSTRUCTION OF “PRELIMINARY DESIGN”

A. Features

On the basis of research on main cultivation modes of design talents at present, it firstly puts forward the imagination of regarding “preliminary design” course as the basic core course of design major and conducts useful researches and exploration practices in earlier stage. It puts forward multi-mode comprehensive design practical training methods to make students rapidly enter into the role at the beginning of entering the school and promote students’ design practice ability, great design thought and team cooperation spirit. It combines students’ quality with professional cultivation to make students benefit more; at the same time, it aims at gradual realization of standardization and systematization of basic professional course system with “preliminary design” as the core.

B. Innovative Points

It combines with professional features of design discipline, builds a basic course teaching system with “preliminary design” as its core and the bridge between basic courses inside the major and professional design courses and makes up for lack of exclusive “preliminary design” course and teaching content in design discipline; It takes “display preliminary design” course as an opportunity to continuously realize cooperation between teaching and scientific research; It explores new course organizational mode, and takes university and enterprise expert giving lecturers and industry design innovation and research center as the basic platform in order to develop students’ exploratory, creativeness and team spirit.

C. Application Value and Promotion

The course construction project is an important professional basic discipline research of design. It can be tightly connected with currently existed teaching system and it is highly operational and universal; During implementation process, it can not only improve education and teaching effect to achieve the purpose of design talent cultivation, but also stimulate students’ team cooperation sense and professional practice responsibility. Students can accept quickly and benefit widely. Thus, it has high application and promotion value in design education system.

IV. SUMMARY AND PROSPECT

A. Course Construction and Teaching Practice Summary of “Display Preliminary Design”:

During practice link of perfecting teaching content, not each round of course has good resource in terms of practical subject opportunity, requiring that we must advance with the times in teaching process and complete teaching adjustments according to actual situation.

This course system interferes with the two big research directions of product and design. Although this paper takes

“display preliminary design” as research opportunity, connecting among courses is not limited to these two items. It is necessary to combine with other courses of this major to conduct researches.

Future work emphasis lies in modification and compiling of handout content of “display preliminary design”, deeper research, adjustment and renewal on concept, development history and current status, main research field, occupational knowledge system, professional skill quality training and other key contents of design. There is a great deal of work to do. Connectivity among different parts is also very important.

B. Prospect

Further perfect improving plan and course content setting and realize conversion between previous research and practical result.

Break through limitations of research group, use open and research-based practical training to enrich classroom teaching more often, cultivate students’ interest in design learning and build a virtuous cycle.

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