Construction and Exploration of Studio Teaching Mode of Design Subject Based on the Subject Characteristics of Design Science

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ABSTRACT

In recent years, a studio teaching model has been paid much attention in the reform of higher education in our country. Aiming at the basic problems of constructing and deepening teaching studio of design majors, this paper makes a brief analysis and summarizes on the characteristics of the design subject; On this basis, it concludes the basic qualities and modeling skills required by the design undergraduate majors; Finally, combined with the teaching practice and phenomenon interpretation in the class, it puts forward the teaching methods and improvement ideas which contain fast design and senior design based on heuristic education, especially the method of academic evaluation. It hopes that these teaching reform ideas and methods will have a certain reference to undergraduate teaching.¹

KEYWORDS

Design science, Subject characteristics, Studio model teaching.

INTRODUCTION

Entering the 21st century, with the development of science and art, technology and aesthetics, furthering integration development. National discipline and professional catalogue adjustment in 2012, design was added to the art category,

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which is a primary discipline. Including product design, Visual communication
design, environment, custom design and 8 undergraduate majors. From the
perspective of subject upgrading, design subject and design major education system,
it still will be a restriction stage after many years educational practice exploration[1].
Many domestic consider our country design educational system to be basically an
experimental design education, this is because our domestic design education was
formed by modern design educational system in the eighties of the last century,
former industrial arts education foundation[2]. In the past 30 years of teaching and
practice, Domestic design & major educator and design science researches is devoted
to design science system exploration structure from beginning to end .After many
years education practice and science investigation, have preliminarily formatted some
design science thought theory and design method theory system, this theory explains
design science characteristic from different sides. Although it explains design
characteristics from different sides it does, Nothing more than answering the design
science questions at a level subject investigated and design method with regard to
answering this question or elaborating related to design what should major education
adhere to the question in what kind of school disciplinarian.

THE FEATURES OF DESIGN SCIENCE

Design is a planned activity, its areas are covered very extensively, Design is a
major about combination of arts and engineering product design, Visual
communication design, environment design, dress design etc. are a discipline scope
Design theory by Professor Li Yan Zu considers that although design science deals
upon four leading majors, design still takes object as the main object, it is a science to
research “man-made science”[3]. In spite of engineering design still discuss natures
problems single traditional engineering design main take fixed measured methods to
research matter itself attribute(include the relationship between things and things, the
properties of the interior of matter etc.) Compared with engineering design, design
science will pay more attention to that substance which influence people
psychology(Artistic aesthetics) and physiology(practicability)study, which Have a
relative absolute science characteristic. Herber A. Simon, the American management
specialist and Nobel winner proposed that “a proper study of man, is a science of
design to a great extent”[4]. The study of human beings especially research for human
and things, prominent design science is essence different from natural science and
humanities and social sciences.

Situational Driving and Experiential Features of Design

Jiang Hong Zhao & Chao Quan Jian, domestic design methodology scholar. They
believe design problems actually are “ill-structured problems” and science can only
handle “Good Problems”. The answer to the design questions is not an optimum
solution of Interactive and optimization, A not-existent cover, AND all full value
effective design function either. So called “ill-structured problem” is that we cannot
depend on simple extract existing knowledge to solve practical problems, only
according to specific situations, based on original knowledge, construct schema for
conduct and solve questions[5]. Besides, the results of modern cognitive psychology
also show, borrow sketch and discussion communications can stimulate creative
potential. Because people’s working memory and information capacity is limited, so
it obstructs the knowledge that is already needed and applied to exercise[6]. Although
long time memory has a large capacity, But it does not allow fast retrieval in related
information, But it can in virtue of debate and discussion, communication language,
picture, draft, data means to help them overcome the working memory that hinders
long term memory, in Order to gain the illuminate effect, This is considered to be the
key to solving the design problem[7]. Thus an outstanding design plan does not
depend on A single concept as foundation, but needs via multiple concepts, principle
and massive empirical background to be combined affect and realize. From this
perspective, design is the progress of “situational driven process”, it is not the process
of scientific standardization solving process.

Design complexity and uncertainty make design solving have quantization
characteristics. Design activity stresses innovativeness from process to result, Design
process is the process of selection and reorganization of information. This is because
design discipline, is different from both natural science, and humanities and art. The
mission of science proves nature, Therefore, it is very clear to judge “YES and NO”.
There are standards that equally have “RIGHT” and “WRONG”. Art has to explain
nature, its explanations include accuracy and inaccurate aspect, non-existent right or
wrong, the difference of understanding a way, concern art standards needs not use a
quantitative approach to distinguish. Design is a discipline that needs to try to find
reasonable relationship between man and nature, Because of the complexity of
people’s sensibility and changeability, which can cause the duality of design, Not only
will IT meet the needs of others, it should also be respect for the laws of nature.
According to the theory of finite rationality, Design evaluation is relative, The actual
goal of design idea is not necessarily the best or the most correct design, but one can
only achieve a satisfactory design under certain conditions, What needs to be
explained is, satisfaction is not a scientific standard, but a human based standard[8].

The uncertainty of design is mainly based on these reasons: first of all, the ultimate
objective of the design is the human side, the complexity of human beings is
manifested in their psychology, aesthetics, personality, diversity of needs, complexity
and so on; secondly, the technological factors of the design are changing, and the
development of the technology is always different from that of changing so fast. there
is no end; again, another is social needs, people’s aesthetic and consumer markets are
changing from time to time, design has to change. of course, people, technology,
markets are organic. The complexity of the design leads to the complexity of the
product, product design has only a few basic methods, principles, thinking patterns,
but it didn’t have any concrete methods, principles, or ideas to solve all the design
problems. In general logic, without a fixed answer, means there is no fixed method, program, or mode of thinking in the process of solving the problem.

**Research Method Based on Life**

This method system is based on system theory, studies and designs from the point of view of life's demand. The theory holds that design is the mechanism by which people do things, in our traditional culture, the five elements of Yin and Yang, the philosophy of Zhou Yi, and the knowledge of objects and other ideas all expound the relationship among people and things and things and things. Herbert A Simon first proposed the concept of the subject of design in 1969. To complement and perfect it again in 1981, the relationship between the object, the environment and the human object is determined formally in the scientific works of human beings. It is the basic determination of the design discipline system. Professor Liu Guanzhong starts from the whole system of Design... The concept of design science is put forward in combination with the traditional thought of principle and artificial science of Simon. He thinks that the object of design is mainly a matter, not a thing... Event is the interaction or exchange of information between people or things in a given time and space, principle includes man and things, also embodying the relationship between them[9]. Get the feeling from the life experience, lifestyle is a big system. So the design should pay attention to the target system requirement, instead of a simple functional design, things are people’s goals, to be achieved by means of things, the principle of creation is realized through specific materials, processes, and equipment. So the design activity is like a writer’s novel in real life, A writer must have considerable experience and correct thinking about life. Different regions, different geographical features and different ethnic groups have different lifestyles, the solution to the problem is different. So, designers first have to experience life, find problems in life, analyze the problems, problem-solving... rather than solving problems in the design room, in the lab, or in the studio. Science of events makes the teaching of design more inclined to the analysis of A life system, the characteristic of systematization, bio-activity and environmental adaptions of the design discipline are the important basis for setting up a professional teaching model.

**Research Methods Biased Towards The Humanities and Social Science**

The design community generally believes that the design discipline is the third subject between the humanities and the science and technology. However, the value of design works is mainly reflected in the creative and innovative aspects of the design orientation and the mode of existence. There are more methods used in design research in the humanities than in the natural sciences(such as Phenomenology and Hermeneutics),《Art Observation》Column host Zhu Shuai thinks: The research of Design should turn from the Humanistic method to the Sociological method, in particular, knowledge of design statistics is more important to a new generation of design researchers[10]. Conceptual Design ability is the designer’s skill, although
creativity and implementation are parallel interactions, But the conceptual design phase is a qualitative research phase, it directly determines whether the later quantitative implementation is necessary. So a broad understanding is needed of culture and artistic literacy and basic and even cutting-edge scientific and technological knowledge is a must for a good designer. A good product designer must have extensive and comprehensive knowledge. Making its conceptual design, having good quality that can be carried out, and although designers don’t need to do specific quantitative experiments, they need to understand the scientific effects and engineering mechanisms of product. Organize and coordinating the ability of engineers to further implement and promote the transformation. Who can say that Chinese design education should cultivate students’ leadership quality. Based on this, Design education should be guided by humanistic and artistic qualities and methods, and cultivation of engineering technical knowledge and design management skills should be carried out in an all-round way.

Case Study Method

The case study actually illustrates the complexity of the design, the design system is like a huge polyhedron, each side represents a field, involving a method, so the study of design has the characteristics of reality, practicality, comprehensiveness, systematism, complexity and so on. There are many variables. We often see a lot of case studies in the field of design, in fact, this is just a reflection of the perceptual and a description analysis method of insight has the characteristic advantage to the design problem. It can make readers get new inspiration and method of design, especially in the local design, REGIONAL design, and Wen Chuang design to obtain the borrowing ability. This is also the basic characteristic of A subject of art, and it is also a major feather of the subject of design[11]. The subject feather is very important in the teaching of design specialty, It is widely used. Visual object and the analysis of display works is the most important method of design teaching. There are still many scholars in China according to the situation of our country, This scholars discuss the characteristics of design science and design education from different angles, I am not going to repeat it here. As a it is complex inter disciplinary and research method that are also bound to be complex and diverse, There may be hundreds of definitions of design, each definition is based on a particular perspective or feature of the design. There is no doubt that these discussions provide an important reference for the overall design of design education in China, as well as the college teaching and postgraduate teaching plan making and planning.

BASIC QUALITY AND SKILL REQUIREMENTS OF DESIGN SPECIALTY

The characteristics of design disciplines to define relationship design undergraduate education should follow the law of running school problems. For
according to the system theory and the comprehensive information theory principle, design is a process of information processing and process flow, in which screens the available information from existing information, and the information reorganization and change process, the final form of innovative information, which this process runs through the whole process of education professional design. The focus of the teaching of design major is to train the design method, which puts forward higher requirements for the students’ design quality and design skills. The real design behavior begins with the selection, change and reorganization of the design information. According to proposition and design requirements, in their minds or externally accessible information is a question of design skills, How students shift through existing knowledge, It is also the key problem to be solved in school education. The whole process is called conceptual design, and its thinking mechanism is the realistic form, the imitation, change and composition of the existing. The screening and recognition of its substantive information, is the ability to change the existing forms. Designers are not scientists and artists, It is the designer’s job to organically combine what one already has and form a new combination of information (product design, graphic design, landscape design) to service for the people, solve the problems of life. Therefore, according to the characteristic of design, design education should focus on two aspects of design quality and design skills to solve the problem.

**Training the Basic Quality of Design**

The prerequisite for human beings to create new things is to have a large amount of design materials related to the object of creation, The famous American anthropologist Clarke Whistler pointed out: Invention is a new relationship conceived or observed between old experiences’ rather than experience itself, It is beyond doubt that all the concrete experience contained in such an invention must have come from the environment[12]. It can be seen that the amount of design information available to students experience is as important as reorganizing the information.

The accumulation of cultural knowledge and living experience is not a problem which can be solved by school education, but it is a very important but for school design education. The most important thing in school education, for students IS, design quality education, Which is to cultivate their interests and hobbies and to carry out differential education. Each student, influenced by the nationality and regional culture of his or her birth, has different educational background and knowledge of Life. In fact, the characteristics of the design are sometimes mainly reflected in the characteristics of culture. Therefore, we can implement different directions of the tutorial teaching model or the sub-studio to give full play to and make full use of the students’ existing knowledge and experience. Regional cultural background, And hobbies, etc, a reachable rive for the best possible direction. At present, China is vigorously developing its traditional culture and national culture, and as a design major, who should inherit and innovate all over the world, The excellent culture of
each ethnic group, making full use of the cultural quality and life experience of all ethnic groups and regional students.

**Improving the Basic Skills of Design**

Generally speaking, the basic knowledge and ability of a major is referred to as professional quality. From the perspective of information theory, design skills mainly refer to the skills and abilities of design methods and methods of expression. Design skills are embodied in the process of design conception and design expression. According to the given proposition, and according to a certain method to obtain design information to collect relevant design materials, screening design information, through a visual representation means and follow a reasonable design procedures, with the selected information that will be combined and changed. The process of reorganizing the original form, structure and technology into a new scheme is called conceptual design. As shown in figure 1, the so-called design process mainly refers to conceptual design, it occupies large segments and core location throughout the design process, the main method of conceptual design is to simulate, change and compose (logical form) the existing design information. Emphasis is placed on training a student in visual information extraction, reorganization, and change skills. Students with strong skills are fluent in thinking and strong in performance. The most important thing in conceptual design is the creative idea, creative conception is decided by theme, image, structure, technology and so on. Students' knowledge of social science, culture, art literacy and basic scientific knowledge often determine the height of design creativity. However, students' knowledge of nature science and engineering technology will affect the feasibility of the design scheme. Reasonable and skillful use of science and technology can make the design have a deep sense of depth. Generally speaking, the students majoring in design are relatively weak in their knowledge of science and engineering, but they should understand the application of various principles of science and so it is also very important to design professional teamwork, organizational coordinate, communication and service skills. In professional teaching, in addition to the topics of conceptual design from self-drafting or design competition, it is better to have a part of the actual design project from the
enterprise, only in this way can the enterprise decision makers and engineers be involved, and students can have real experience of cooperation, communication and coordination with the enterprise and society while they are in contact with them. technology, have team spirit, be good at cooperating with engineers, and promote the implementation of design.

The emphasis of design education in colleges and universities lies in the cultivation of design skills. The skill of design major mainly refers to two kinds of abilities: design method and expression technique, such as sketch, color, design composition, presentation technique, computer aided design, product model making, etc. The design methods include creative thinking and innovative techniques, which are finally embodied and pulled in the process of design performance. Therefore, the relative design quality, the function of design skills in the later period, the basic quality needs to be transformed into an effective design element with the help of design skills. As mentioned earlier, a designer needs a lot of information related to the design object when it is conceived. The greater the amount of information, the more likely it is to produce a good design, but the mind of a person's brain thinking is similar to that of a CPU in a computer host, and it can’t hold more information at the same time, IT needs to import information from The hard disk and external hard disk processing, in cognitive psychology called long-term memory (such as have learned memory knowledge, life experience)and external memory(various related design research materials) It can be seen that the material is material. Skills are the means’ the relationship between the two is the relationship between the process and processed” indispensable ”teaching design can be used as the basis for the construction of design professional quality and skills training program. The dialectical relationship between graphic representation and visual thinking of design discipline reflects the
characteristics of design classroom design. The design of classroom is neither regular nor theory lecture, A science experiment course or the general meaning of curriculum design, the design should be an open and creative studio, students and teachers can use visual sketches, charts, models, etc. as the intermediary to form an interactive Creative Media Group.

CONCLUSIONS

As the object of study, the content and method of design under the category of art are different from those of humanities science and technology. The object of design research is A materialized human and humanized object, which mainly deals with the relationship between design and human beings, that is, design object and human existence, life and production relations. Product design and industrial design are important Specialty categories under Design discipline, they mainly study the relationship between products and people’s living environment, products and culture art and the relationship between products and people’ needs. At the same time, the design is also based on the teaching of the designer itself, and it is not suitable to adopt the unified standard of conventional teaching, it should aspect and advocate the design differences. In addition, because of the different geographical conditions in different colleges and universities, the local culture and local economic characteristics are different, and there are differences in their life experience, culture back grand, knowledge experience and hobbies. Therefore, it is imperative to combine the characteristics of the design, the regional characteristics and the differences of the three of the educated to complement the new design professional teaching model.

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